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ANALYSIS OF OPERATIONAL REQUIREMENTS FOR MEDIUM DENSITY AIR TRANSPORTATION

APPENDIX

VOLUME III
MARCH 1975

PREPARED UNDER CONTRACT NO. NAS2-8135
FOR
SYSTEMS STUDIES DIVISION
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MOFFETT FIELD, CALIFORNIA 94035

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FOREWORD

This Volume III contains the supporting data to Volume II, Final Report, of a contracted study performed for NASA, "Analysis of Operational Requirements for Medium Density Air Transportation", by the Douglas Aircraft Company, McDonnell Douglas Corporation.

The NASA Technical Monitors for the study were Thomas L. Galloway and Susan N. Norman, Systems Studies Division, Ames Research Center, Moffett Field, California.

The Douglas Study Team consisted of J. Seif, Technical Director, assisted by M. A. Sousa, responsible for Aircraft Analysis, and S. C. Nelson, responsible for Systems Operations and Economic Analysis. The following personnel contributed to the study effort in the disciplines as indicated:

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The subcontractor participation included the following companies and personnel:

Air California	:	F. R. Davis
American Airlines	:	J. D. Graef
Cessna Aircraft	:	O. D. Mall
North Central Airlines	:	C. B. Vesper

Appreciation for their cooperation and contribution is extended to:

Avco Lycoming Division
Avco Corporation

Detroit Diesel Allison Division
General Motors Corporation

General Electric Company
Aircraft Engine Group

Hamilton Standard Division
United Aircraft Corporation

The nine month study, initiated in March 1974, was divided into three tasks: Task I - Aircraft Requirements; Task II - Aircraft Design Study; and Task III - Evaluation.

The final report for this study is presented in three volumes as follows:

Volume I Summary	- A summary of the significant study results
Volume II Final Report	- A detail description of the study and results
Volume III Appendix	- The supporting study data, methods, and analyses.

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APPENDIX A – AIRCRAFT

A.1 PERFORMANCE ANALYSIS METHODS AND GROUNDRULES

A.1.1 Aircraft Sizing

The sizing process is illustrated by figure A-1. Thrust-to-weight and wing loading combinations which satisfy the takeoff and landing field length requirements together with parametric weight data ($OEW = f(TOGW, W/S, T/W)$), installed thrust and tail sizing information are used as inputs to a computer program which performs the aircraft sizing calculations. A typical mission profile used for airplane sizing is shown in figure A-2.

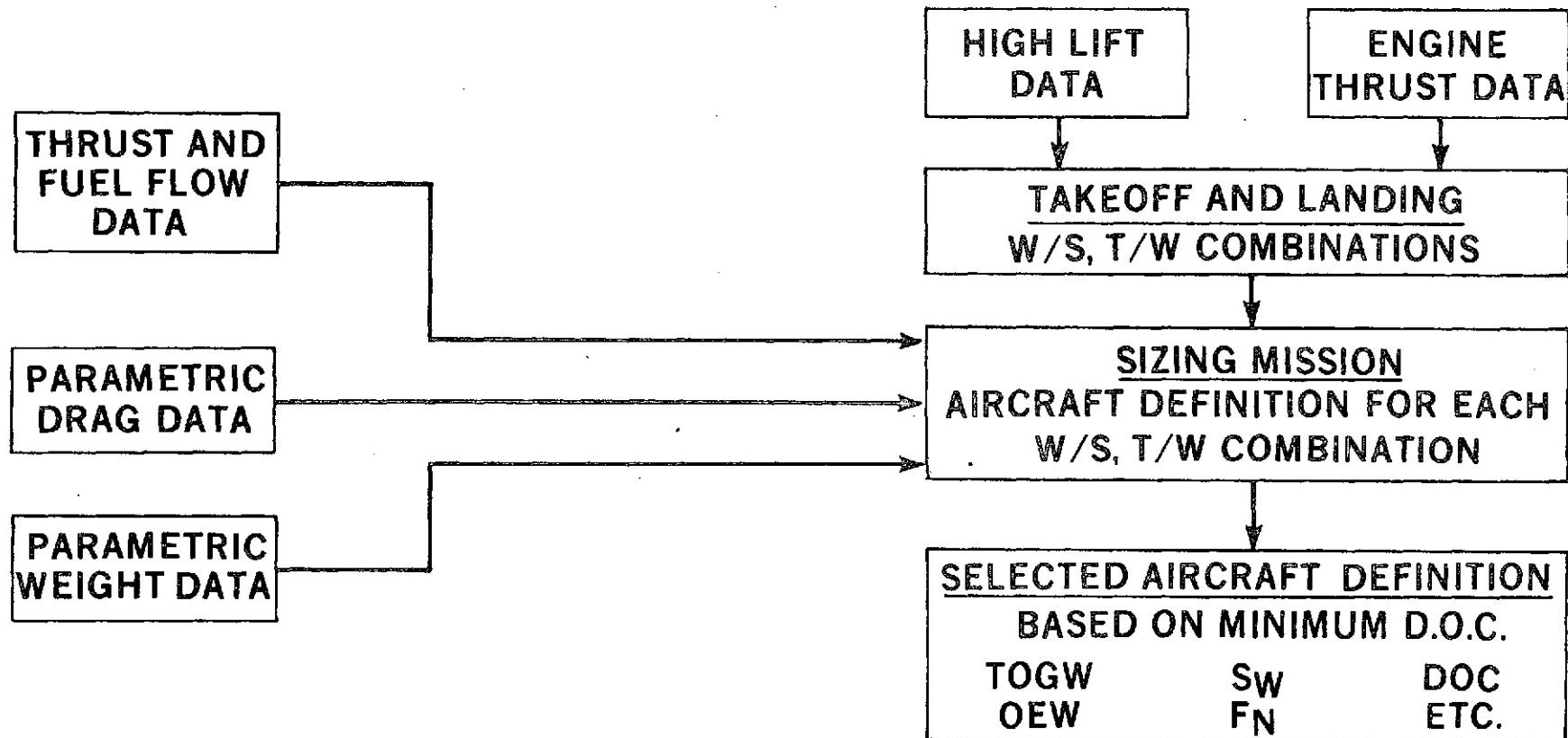
A.1.2 Takeoff

STOL takeoff performance was estimated by calculating the time history of the takeoff flight path. This method allows for recognition of changes in aerodynamic characteristics and flight limitations which occur during the maneuver. The calculations are governed by the following assumptions:

1. The aircraft is assumed to be a point mass, i.e., second-order rotational dynamics have been ignored and the analysis is essentially two dimensional.
2. The forces acting on the aircraft are summed in the longitudinal and normal directions and are a function of true airspeed, flight path angle, angle of attack and height above the ground.
3. Any restriction on speed, acceleration, attitude, etc., may be imposed as desired.
4. The path is generated by numerical integration of the forces acting on the aircraft over small increments in time using a digital computer.

Based on FAR Part 25 requirements, takeoff field length was defined as the greater of:

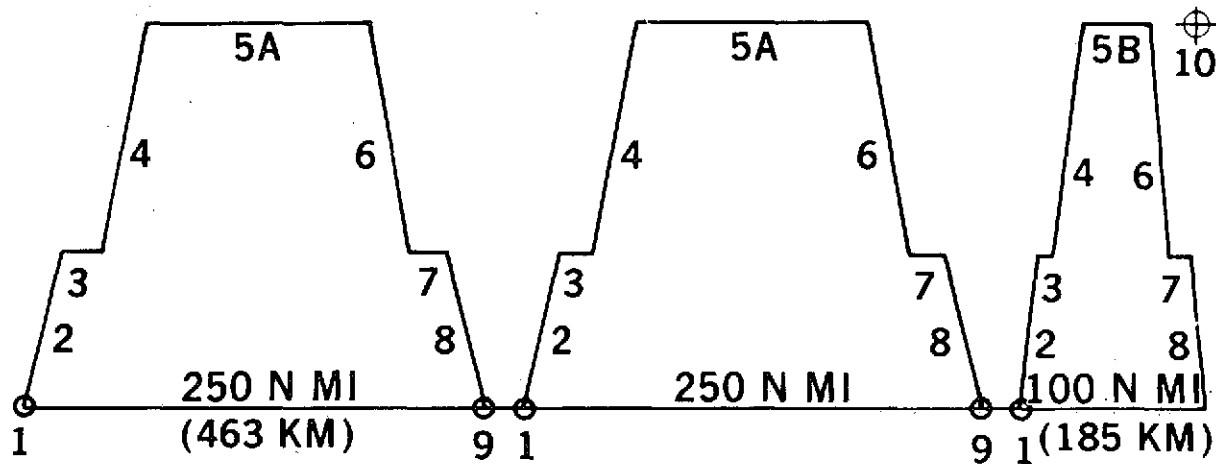
AIRCRAFT SIZING PROCESS



A-2

FIGURE A-1

SIZING MISSION PROFILE



1. TAXI-OUT (3 MINUTES) AND TAKEOFF AND ACCELERATE TO BEST CLIMB SPEED (2 MINUTES)
2. CLIMB AT 250 KIAS (129 M/S) TO 10,000 FT (3048 M)
3. ACCELERATE TO CLIMB SPEED
4. CLIMB AT 300 KIAS (154 M/S) TO CRUISE ALTITUDE
- 5A. CRUISE AT MAX MACH NO. AT $\leq 25,000$ FT (7620 M)
- 5B. CRUISE AT 99 PERCENT MAX SPECIFIC RANGE
6. DESCEND TO 10,000 FT (AT FLIGHT IDLE, INCL 300 KIAS PRESSURIZATION CABIN RATE LIMITED DESCENT).
7. DECELERATE TO 250 KIAS
8. DESCEND AT 250 KIAS TO S.L.
9. APPROACH AND LAND (3 MINUTES) AND TAXI-IN (2 MINUTES)
10. HOLD (45 MINUTES) AT MAX ENDURANCE

FIGURE A-2.

1. $1.15 \times$ all-engine takeoff distance to 35 feet (10.7 m) height.
2. Distance to 35 feet (10.7m) height with critical engine failure at V_1 .
3. Distance to accelerate to V_1 and then decelerate to a stop.

The following constraints were used in calculating the takeoff field lengths for the final design aircraft.

1. Rolling friction, $\mu = 0.025$.
2. Fuselage angle of attack \leq ground limit = 15° .
3. Rotation rate, $\theta \leq 5^\circ/\text{sec}$.
4. $C_L \leq 90\%$ of $C_{L\max}$ out of ground effect.
5. $C_L \leq 100\%$ of $C_{L\max}$ in ground effect.
6. No deceleration during air run to 35 feet (10.7m) height.
7. Early rotation at a speed of 5 knots (2.57 m/sec) less than the design rotation speed will not result in an increase in the one-engine-out takeoff distance.
8. Accelerate-stop distance based on one second delay to recognize an engine failure at V_1 plus a three second delay to initiate braking followed by a deceleration of $0.425g$ to a stop.
9. Second segment climb gradient (at V_2 , with takeoff flap setting, critical engine inoperative, gear up and out of ground effect)
 - 3.0% for four-engine aircraft
 - \geq
 - 2.4% for two-engine aircraft

A.1.3 Landing

The methods and assumptions used in calculating landing field lengths are essentially the same as those used for takeoff performance. The landing maneuver consists of three segments; approach, flare and ground roll as shown in figure A-3. Landing field length is defined as the landing distance over a 50-foot (15.2 m) obstacle divided by a 0.6 factor, i.e., a 4500-foot (1372 m) field length requires a landing distance of 2700 feet (823 m).

LANDING FIELD LENGTH DEFINITION

A-5

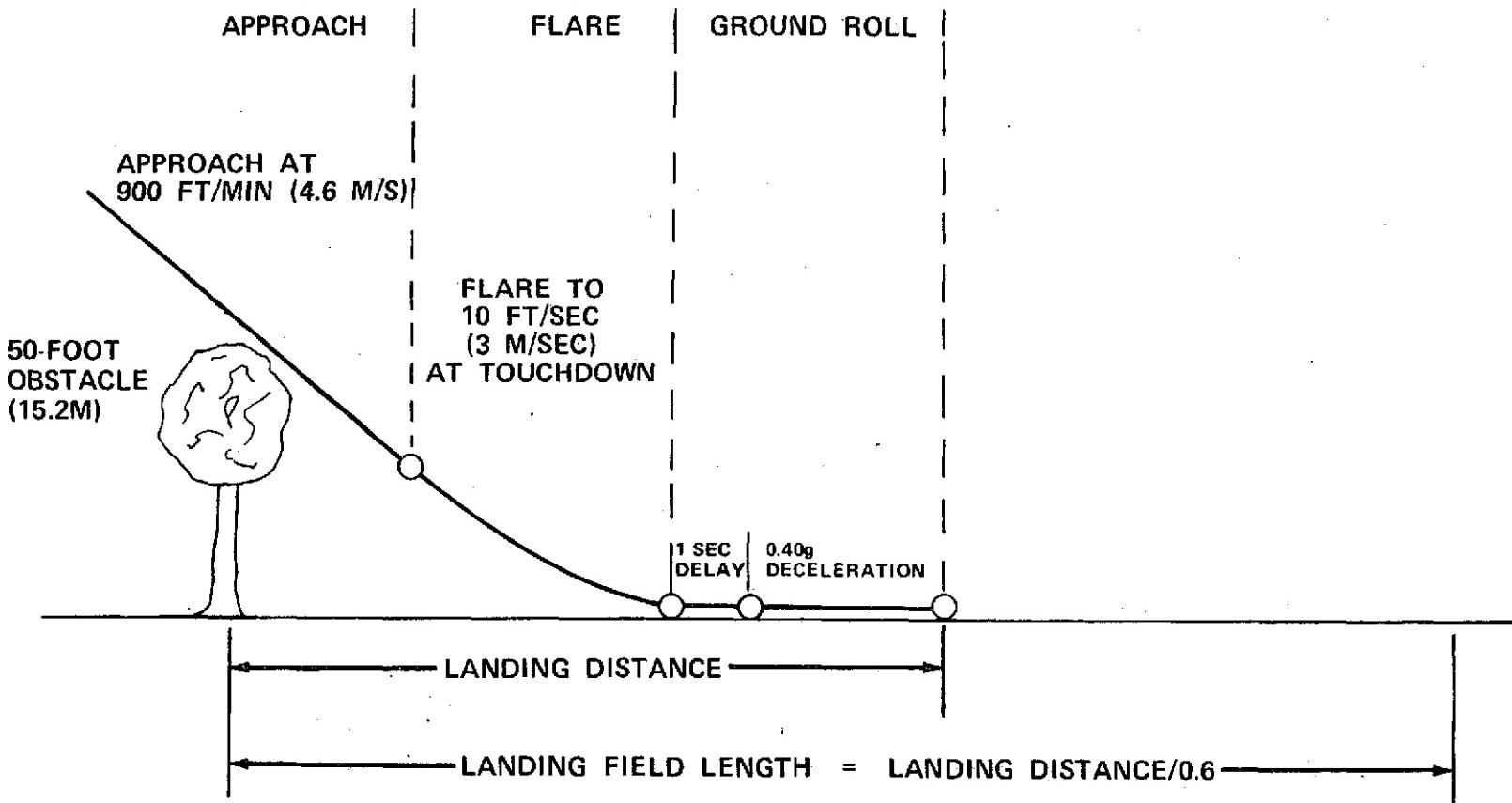


FIGURE A-3.

The approach conditions were:

1. $1.3 V_{min}$ approach speed at 50° (0.873 rad) flap setting.
2. 900 fpm (4.57 m/sec) approach sink rate.

The flare maneuver was performed by rotating the aircraft $5^\circ/\text{sec}$ (0.087 rad/sec) starting at the flare height. As the aircraft approaches the ground C_L and C_D tend to diminish due to ground effect. The flare height was selected to yield a touchdown sink rate of 10 fps (3 m/sec).

The ground roll consists of one second at constant speed from touchdown to deceleration device effectiveness followed by a constant deceleration of 0.40g to a stop. Landing, like takeoff, was calculated for sea level, 90°F (32.2°C) conditions.

A.1.4 Mission

The mission calculations, for the mission profile previously shown in Section A.1.1; figure A-2, are performed in a computer program specifically developed by Douglas Aircraft Company during the last five years for the sizing of aircraft in the advanced design stage. The methods used are essentially those of classical airplane performance. The computer program calculates 2 degrees-of-freedom mission time histories, iterating on weight, thrust, drag and tail sizing data to determine such characteristics as TOGW, wing area, engine size, OEW, fuel burned, etc. of an aircraft which satisfies the requirements of the mission profile with the desired payload.

Cruise altitude, not exceeding 25,000 feet (7620 m), and climb Mach number were optimized to minimize DOC. Mission performance was calculated for standard day conditions.

A.2 AERODYNAMIC CHARACTERISTICS

A.2.1 High Lift Configuration Aerodynamic Characteristics

A.2.1.1 Nominal High-Lift System – Turbofan Aircraft

The nominal flap aircraft utilize the DC-9-30 leading edge slat and trailing edge flap concept; see figure A-4. Basic DC-9-30 longitudinal high-lift characteristics were adjusted to a lower quarter chord sweep of 5 degrees (0.087 rad) using Douglas developed analytical and empirical methods. Differences in flap effected area and wing aspect ratio between the DC-9-30 and the nominal flap aircraft were small and offsetting, so were neglected. The estimated out-of-ground effect longitudinally trimmed lift-and-drag characteristics for the nominal flap aircraft are presented in figure A-5. The maximum lift coefficients for determining the l_g and V_{min} stall speeds are presented in table A-1. The estimated engine-out lateral-directional trim increments used in the performance analysis are based on Douglas-derived analytical and empirical methods which have shown good correlation with flight test data. The equation form used for calculating these increments is shown below in table A-2.

A.2.1.2 Nominal High-Lift System – Turboprop Aircraft

The basic high-lift configuration consists of a full span slat and double slotted trailing edge flap similar to that used on the turbofan nominal flap configuration, Section A.2.1.1. Low speed aerodynamic power effects were estimated from Datcom analytical methods and applicable wind tunnel data, which were used to refine the Datcom methods to apply more specifically to the particular turboprop configuration for this study. The refined methods account for engine-out span load distortions which produce a loss of powered lift efficiency and increased induced drag at a given level of lift.

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NOMINAL DC-9-30 TYPE HIGH LIFT SYSTEM

SUPER CRITICAL WING NOT REPRESENTED

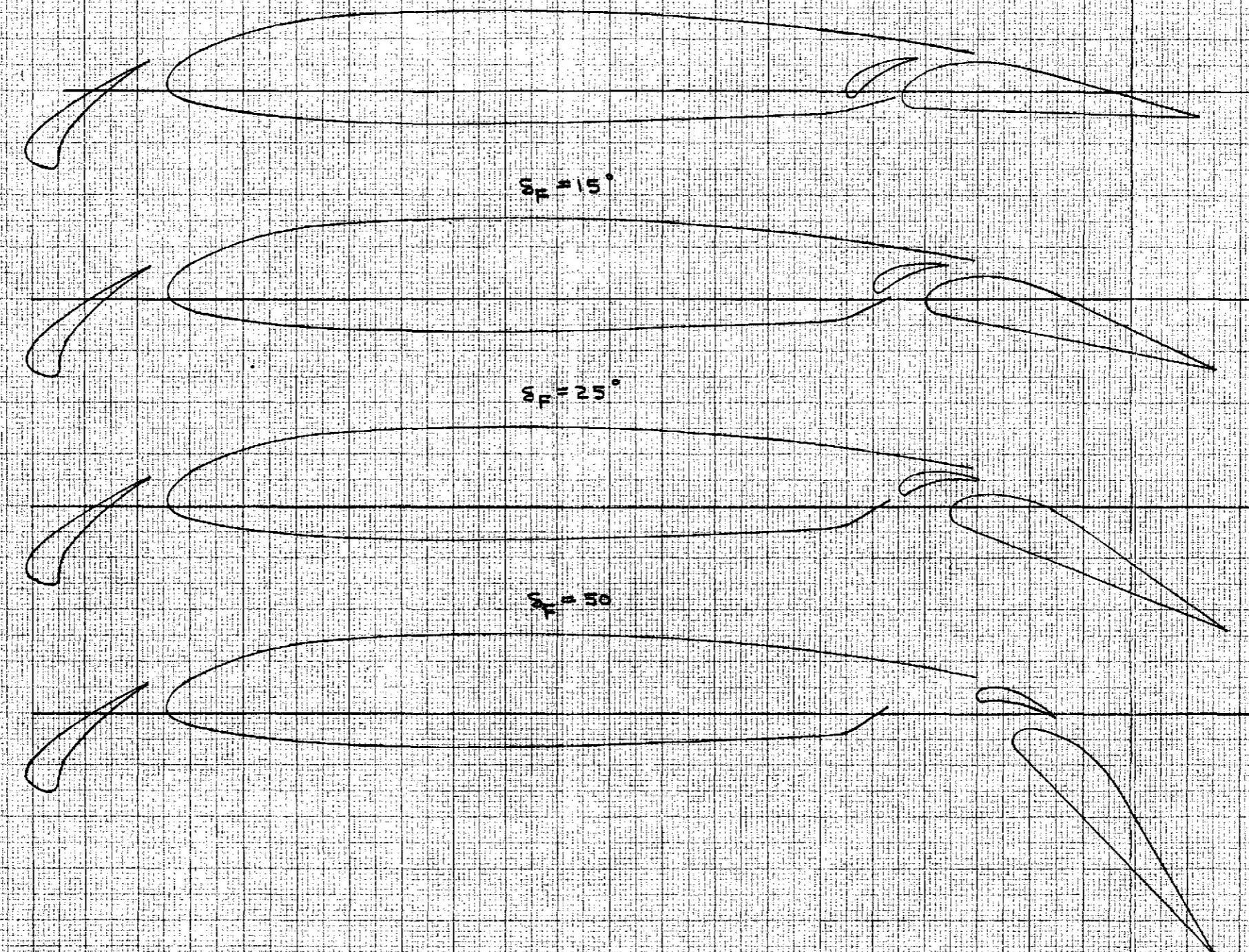
$(C_F/C)_{NESTED} \approx .30$

$$S_F = S^*$$

$$S_F = 15^\circ$$

$$S_F = 25^\circ$$

$$S_F = 50$$



0 10 20 30 40 50 60 70 80 90 100
PERCENT WING CHORD

FIGURE A-4

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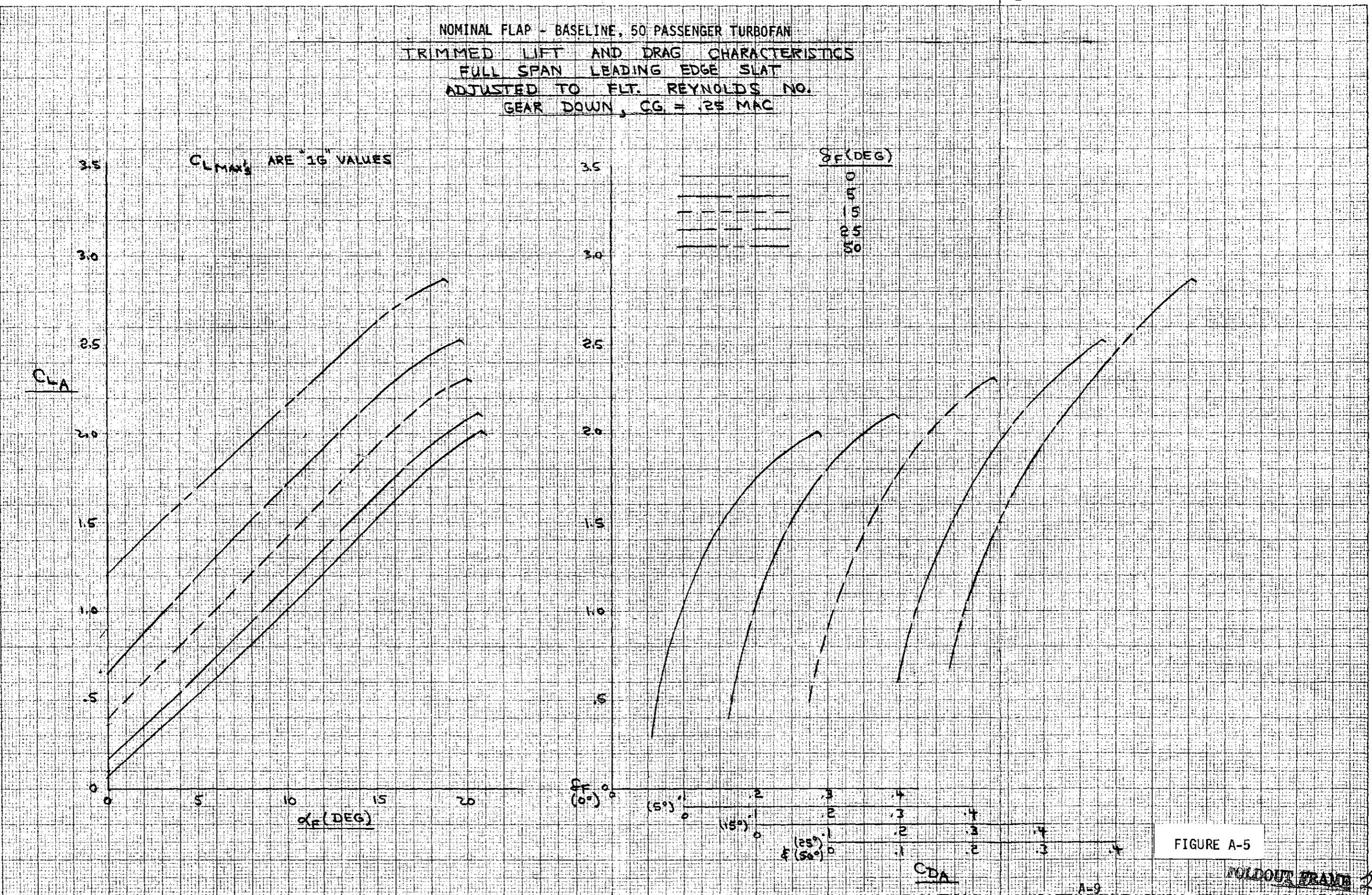


TABLE A-1

NOMINAL HIGH LIFT SYSTEM, MAXIMUM LIFT COEFFICIENTS

<u>FLAP ANGLE (degrees/radians)</u>	<u>C_{L_M}_{ig}</u>	<u>C_{L_M}_{vmin}</u>
0/0	2.01	2.08
5/0.087	2.11	2.24
15/0.262	2.32	2.46
25/0.436	2.52	2.63
50/0.873	2.87	3.00

TABLE A-2

ENGINE-OUT LATERAL-DIRECTIONAL TRIM INCREMENTS-TURBO-AN AIRCRAFT

$$\Delta C_D_{\text{trim}} = 0.00012 \times \left(\frac{\Delta f_{\text{WIND-MILLING JET}}}{S_w} + \frac{F_N_{\text{ASSYMETRIC}}}{q_\infty \times S_w} \right)^2$$

where:

ΔC_D_{trim} = lateral-directional trim increment due to an engine failure

$\Delta f_{\text{WIND-MILLING JET}}$ = parasite drag area due to a wind-milling engine

$F_N_{\text{ASSYMETRIC}}$ = net thrust of engine which is contributing assymetric thrust for an engine failed condition

q_∞ = freestream dynamic pressure $\left(\frac{1}{2} \rho V_\infty^2\right)$

S_w = reference wing area

The basic aircraft configuration can be trimmed laterally, engine-out, with ailerons alone; i.e., without the use of spoilers. Therefore, the lateral directional trim effects consist entirely of drag increments. The resulting lateral-directional trim drag increments were reduced to an equation form, shown in table A-3, and applied to the longitudinally trimmed engine-out aerodynamic data. Figures A-6 through A-15 show the longitudinally trimmed aerodynamic data for the turboprop aircraft.

1.1.3 Simple High-Lift System

The basic concept of the simplified high-lift system is the elimination of the leading-edge slat from the nominal high-lift system, which is described in section A.2.1.1.

Due to the simplified method which sufficed for evaluating the merits of the simple high-lift system, only the maximum lift coefficients were required for this system. These values are presented in table A-4 for both l_g and V_{min} stall conditions.

1.1.4 Advanced High-Lift System

The advanced flap aircraft incorporates a high-lift system that provides for large increments in lift at a fixed angle of attack, high lift-to-drag ratios especially at takeoff and climb-out flap settings, and high values of maximum lift coefficient. In order to achieve these requirements a track mounted flap with considerable aft extension with flap deflection is required. The following is a basic description of the high-lift system:

1. Trailing-edge flaps are track mounted, two-segment, double-slotted flaps employing considerable aft extension with flap deflection; see figure A-16.
2. The nested flap chord is 35% of the wing chord.
3. The trailing-edge flap is continuous spanwise from the fuselage to the aileron.

TABLE A-3
ENGINE-OUT LATERAL-DIRECTIONAL TRIM INCREMENTS-TURBOPROP AIRCRAFT

$$\Delta C_D_{\text{engine-out}} = (-0.0013 + 0.0001 \times \delta_F) \alpha + (0.12 + 0.001 \times \delta_F) \times T_c$$

where:

$\Delta C_D_{\text{engine-out}}$ = lateral-directional trim increment due to an engine failure

δ_F = flap angle, degrees

α = aircraft angle of attack, degrees

T_c = net thrust coefficient $\left(\frac{\text{aircraft net thrust}}{q_\infty S_w} \right)$

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TURBOPROP HIGH-LIFT, TWO ENGINE, NOMINAL FLAP, 0°

BOTH ENGINES OPERATING
FULL SPAN LEADING EDGE SLAT
GEAR DOWN, CG @ 25% C

$\alpha = 3.9^\circ (\delta_f = 0^\circ)$

Nominal Flap

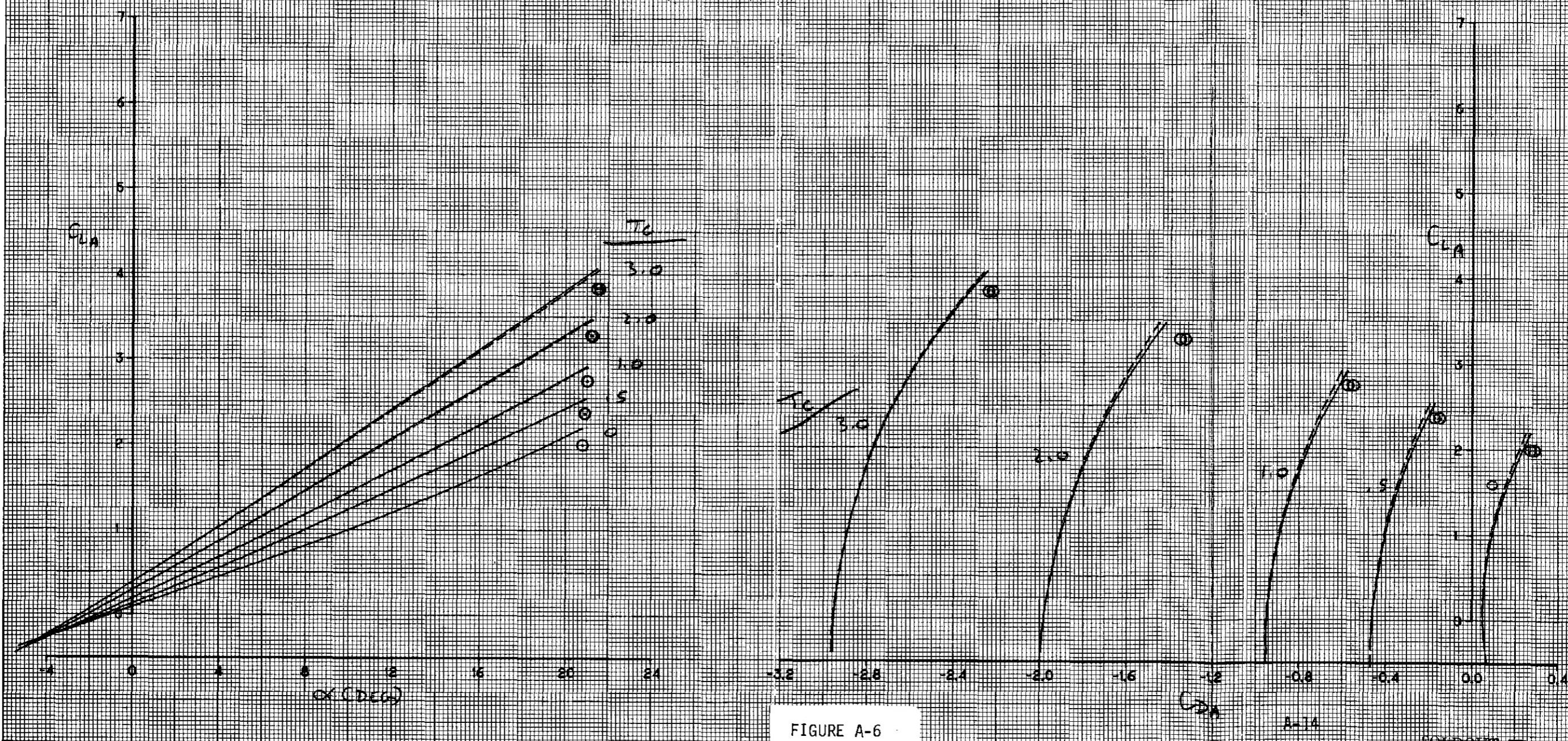
$AR = 9.0$
 $AR = 10.5$

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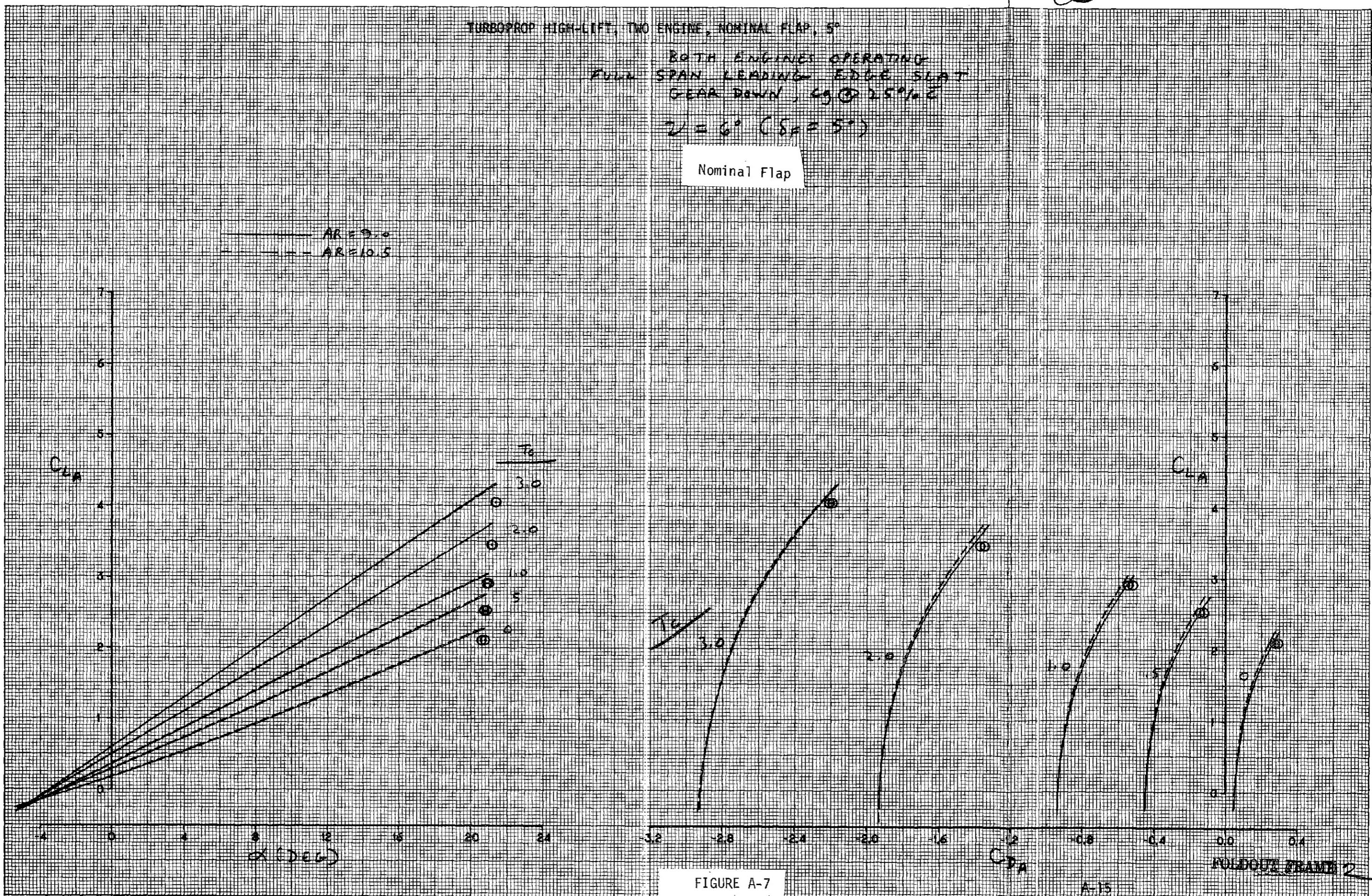
JT FRAME

FIGURE A-6

JOHNSON FRAME

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TURBOPROP HIGH-LIFT, TWO ENGINE, NOMINAL FLAP, 15°

BOTH ENGINES OPERATING
FULL SPAN LEADING EDGE SLAT
GEAR DOWN, $C_D = 2.5\%$

$\gamma = 10.4^\circ$ ($\delta_f = 15^\circ$)

Nominal Flap

$AR = 9.0$
 $AS = 10.5$

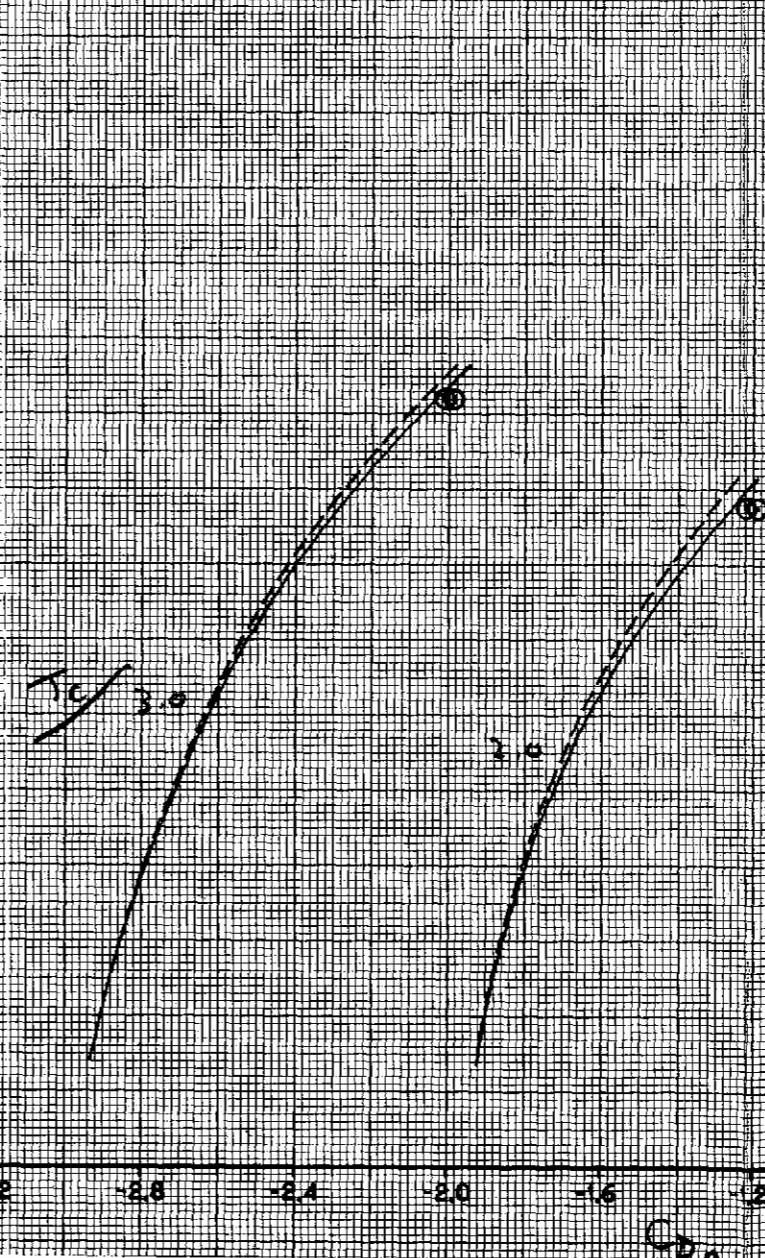
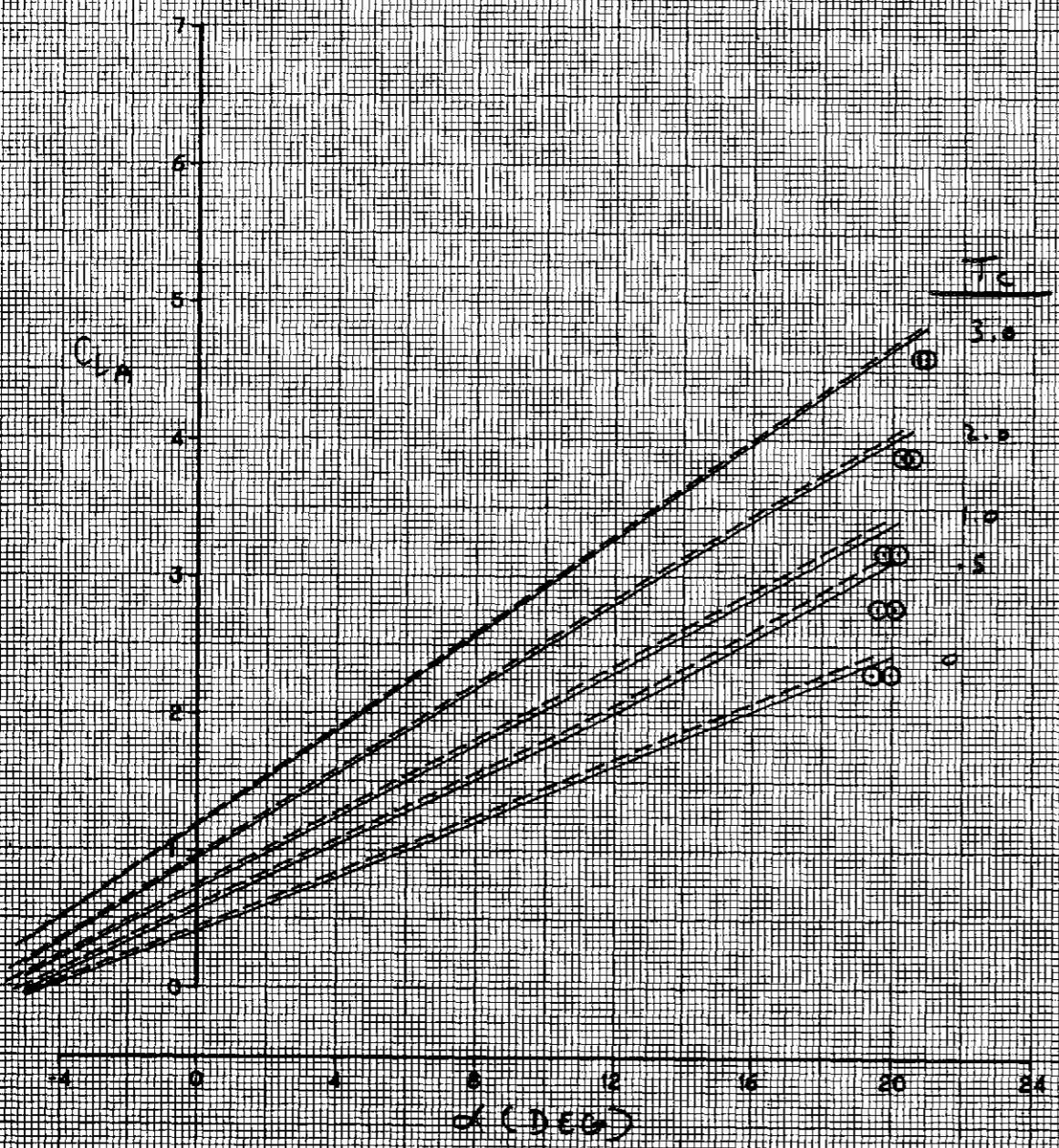


FIGURE A-8

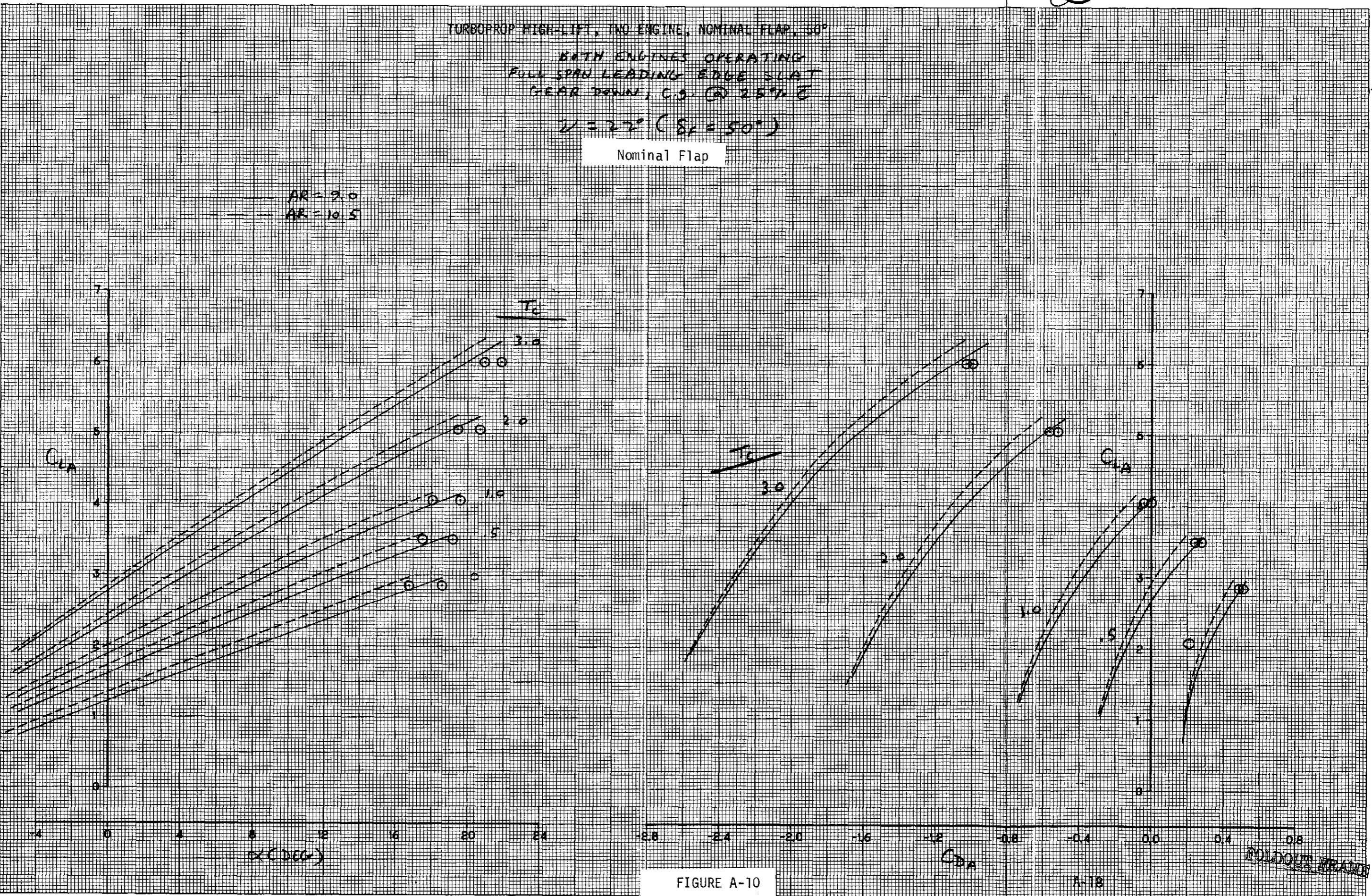
A-16

WIND TUNNEL TESTS

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FOLDOUT FRAME

TURBOPROP HIGH-LIFT ONE ENGINE, NOMINAL FLAP, 0°

ONE ENGINE OPERATING
FULL SPAN LEADING EDGE SLAT
GEAR DOWN, C.G. @ 25% L.C.

$$\gamma = 3.9^\circ \quad (\delta_F = 0^\circ)$$

LATERAL DIRECTIONAL TRIM
ADDED SEPARATELY

Nominal Flap

AR = 9.0
AR = 10.5

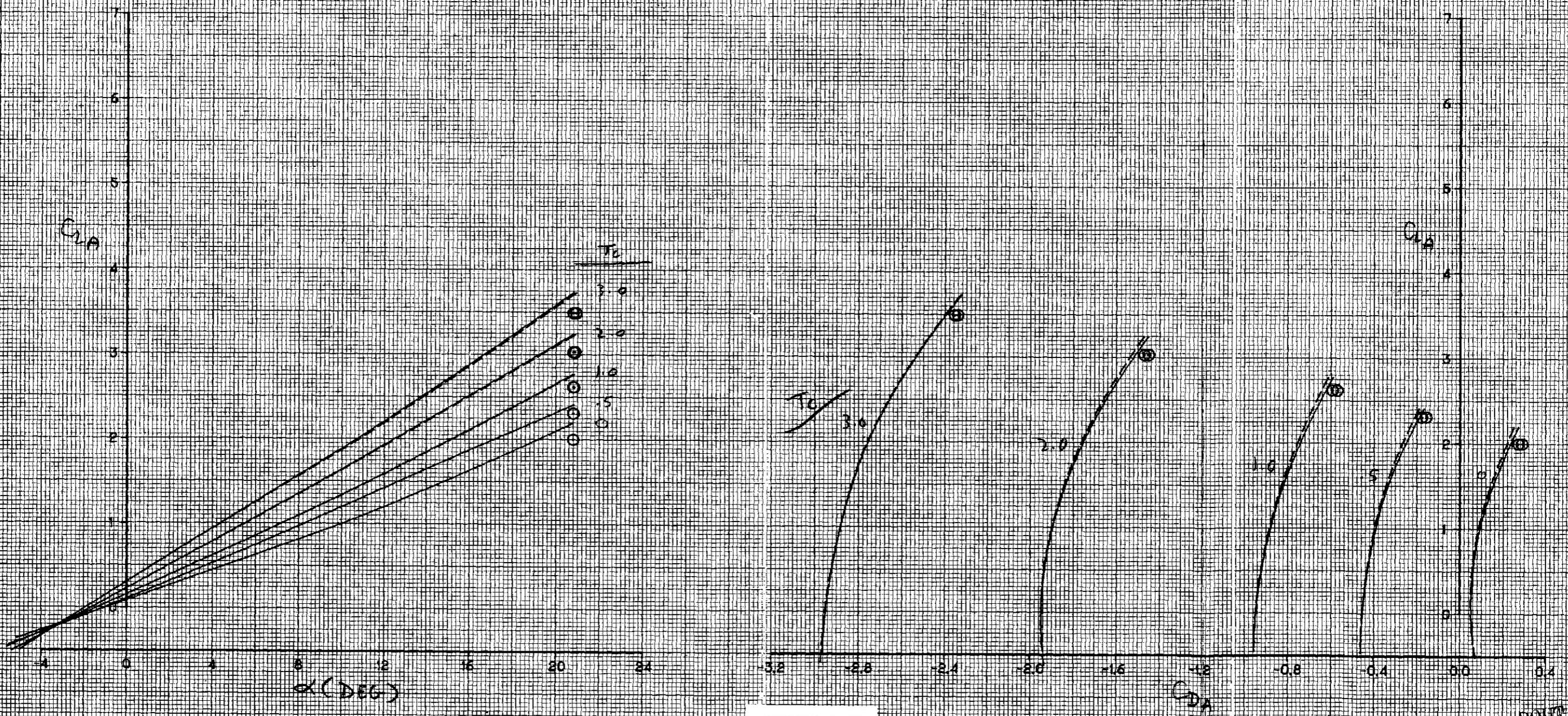


FIGURE A-11

A-19

FOLDOUT FRAME

REvised
DATE 7-17-72

REPORT NO.
PAGE NO.

PREPARED BY: R.D.W.

REFERENCE

FOLDOUT FRAME

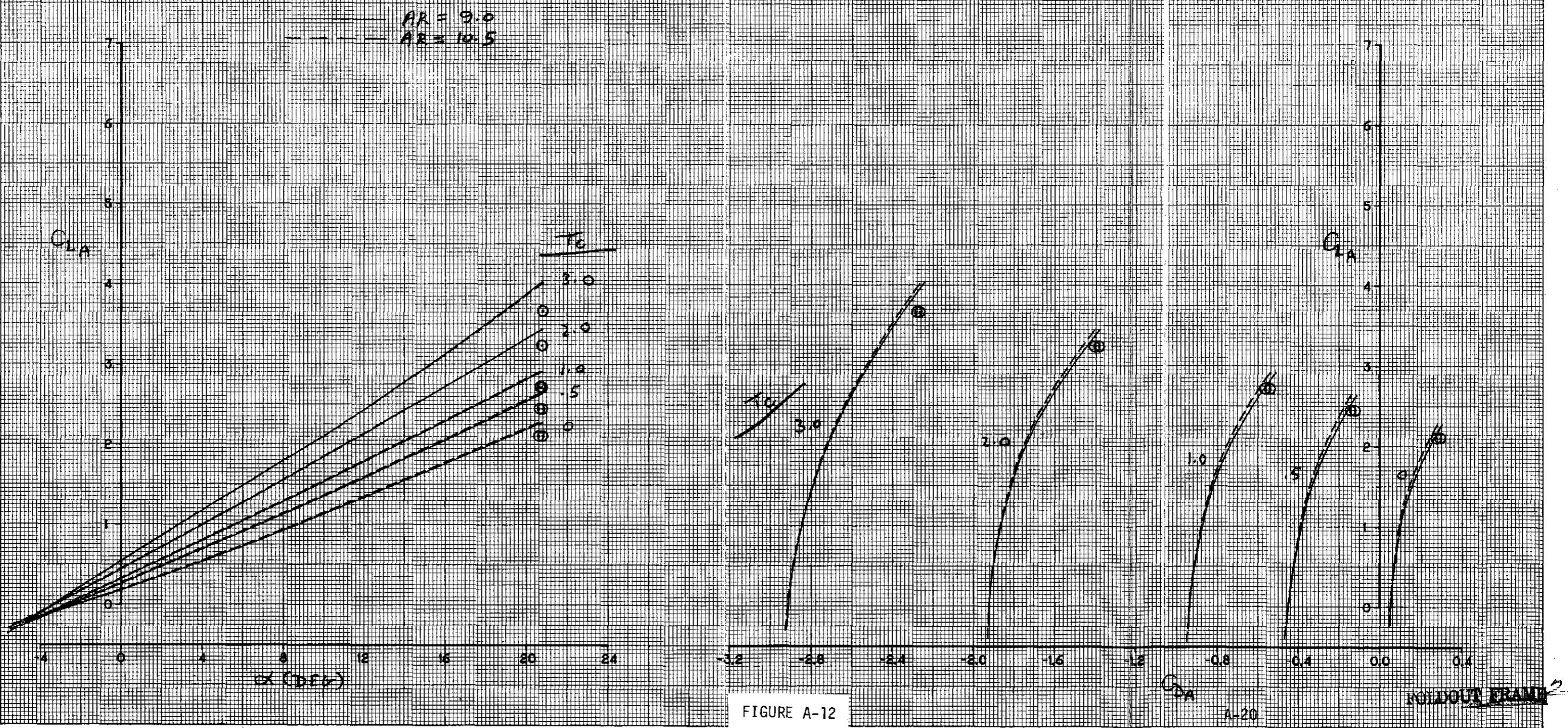
TURBOPROP HIGH-LIFT, ONE ENGINE, NOMINAL FLAP, 5°

ONE ENGINE OPERATING
FULL SPAN LEADING EDGE SLAT
GEAR DOWN, CG @ 25%²

$$\alpha = 6^\circ (\delta_F = 5^\circ)$$

LATERAL DIRECTIONAL TRIM
ADDED SEPARATELY

Nominal Flap



DOUGLAS

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TURBOPROP HIGH LIFT, ONE ENGINE, NOMINAL FLAP, 15°

ONE ENGINE OPERATING
FULL SPAN LEADING EDGE SLAT
GEAR DOWN, $c_g @ 25\% C$

$$V = 10.4^{\circ} (S_F = 15^{\circ})$$

LATERAL DIRECTIONAL TRIM
ADDED SEPARATELY

Nominal Flap

$$\begin{aligned} AR &= 9.0 \\ AR &= 10.5 \end{aligned}$$

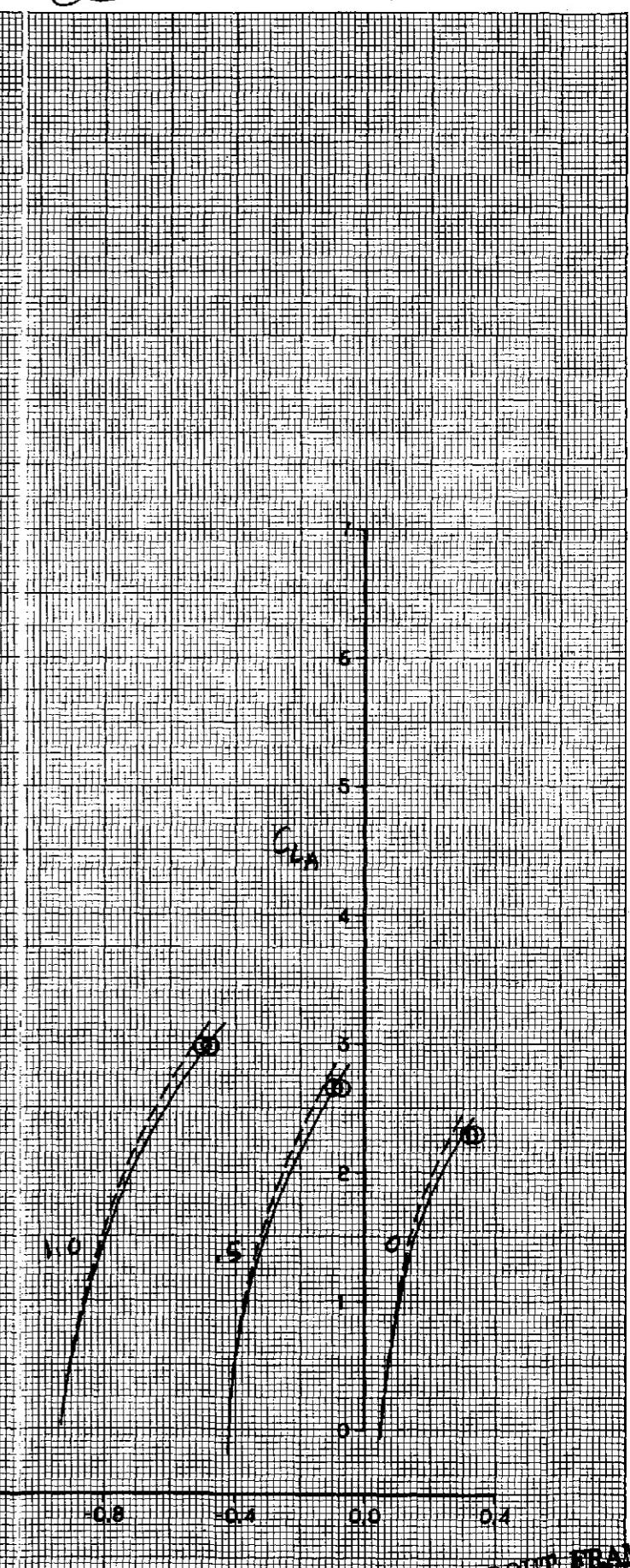
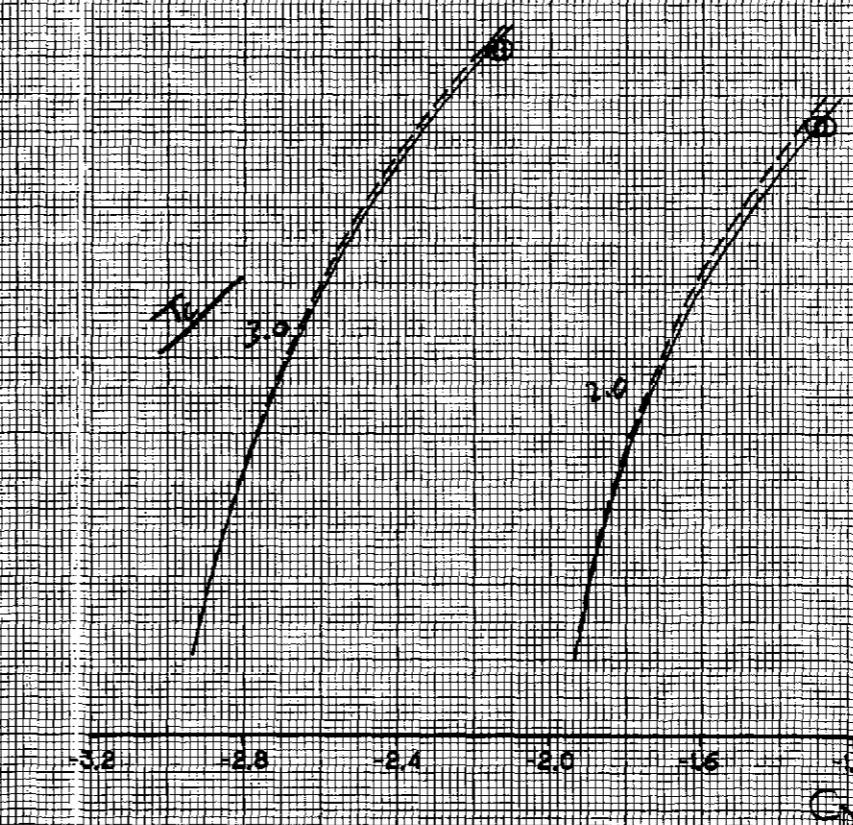
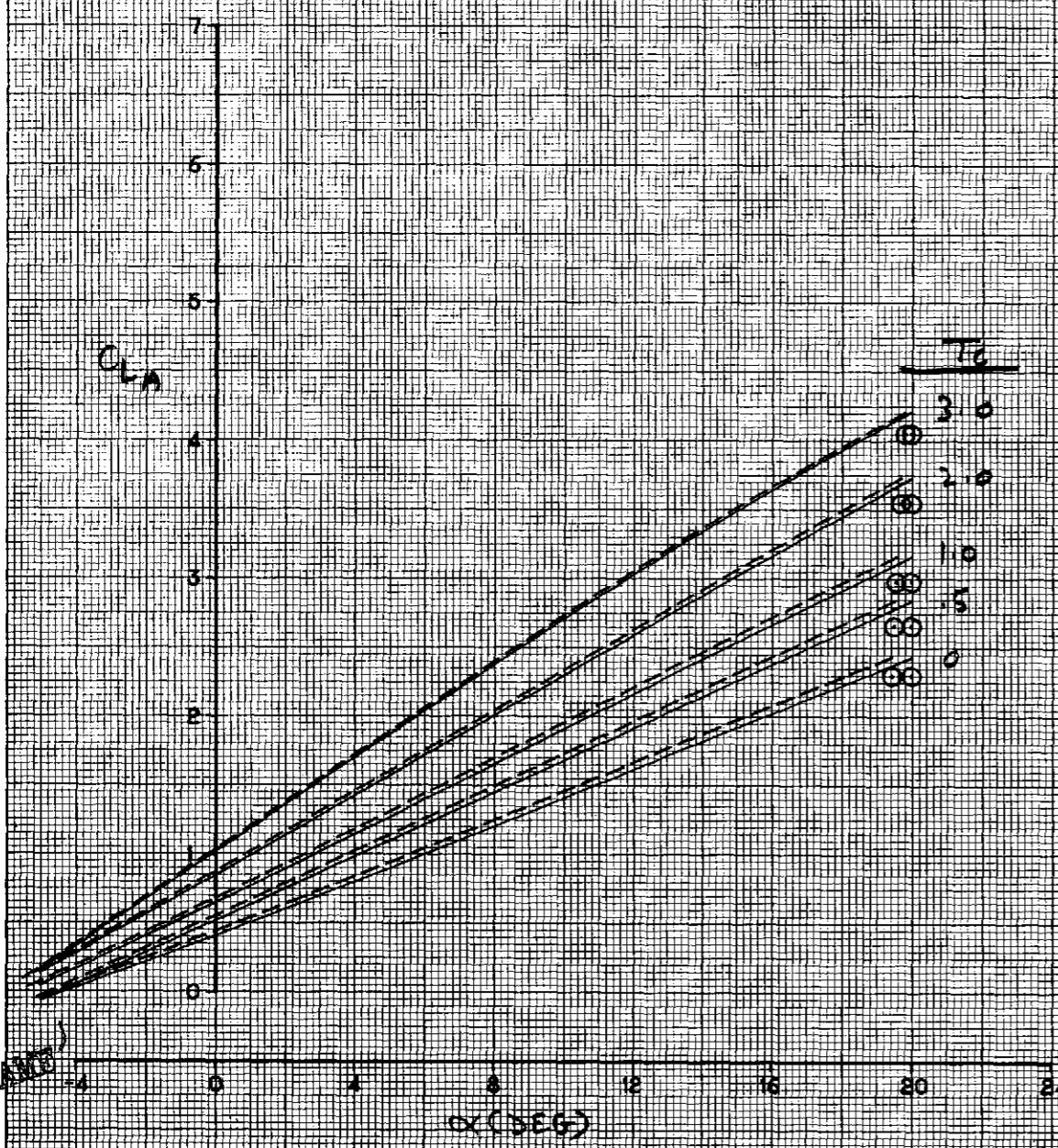


FIGURE A-13

DOUGLAS

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MODEL: 2D Inv.
REFERENCE: _____
REvised _____
DATE: 2-17-79
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TURBOPROP HIGH-LIFT, ONE ENGINE, NOMINAL FLAP, 25°

ONE ENGINE OPERATING
FULL SPAN LEADING EDGE SLAT
GEAR DOWN, CG @ 25% C

$$\gamma = 14.2^\circ (\delta_f = 25^\circ)$$

LATERAL DIRECTION TRIM
ADDED SEPARATELY

Nominal Flap

AR = 9.0
AR = 10.5

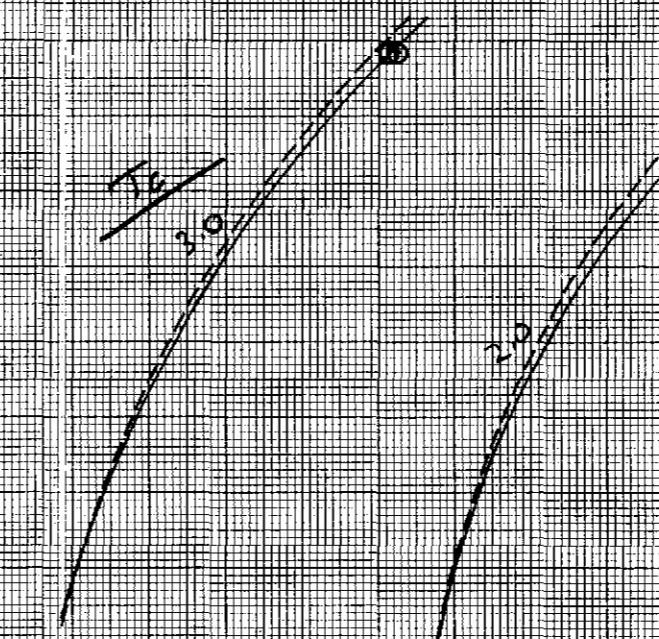
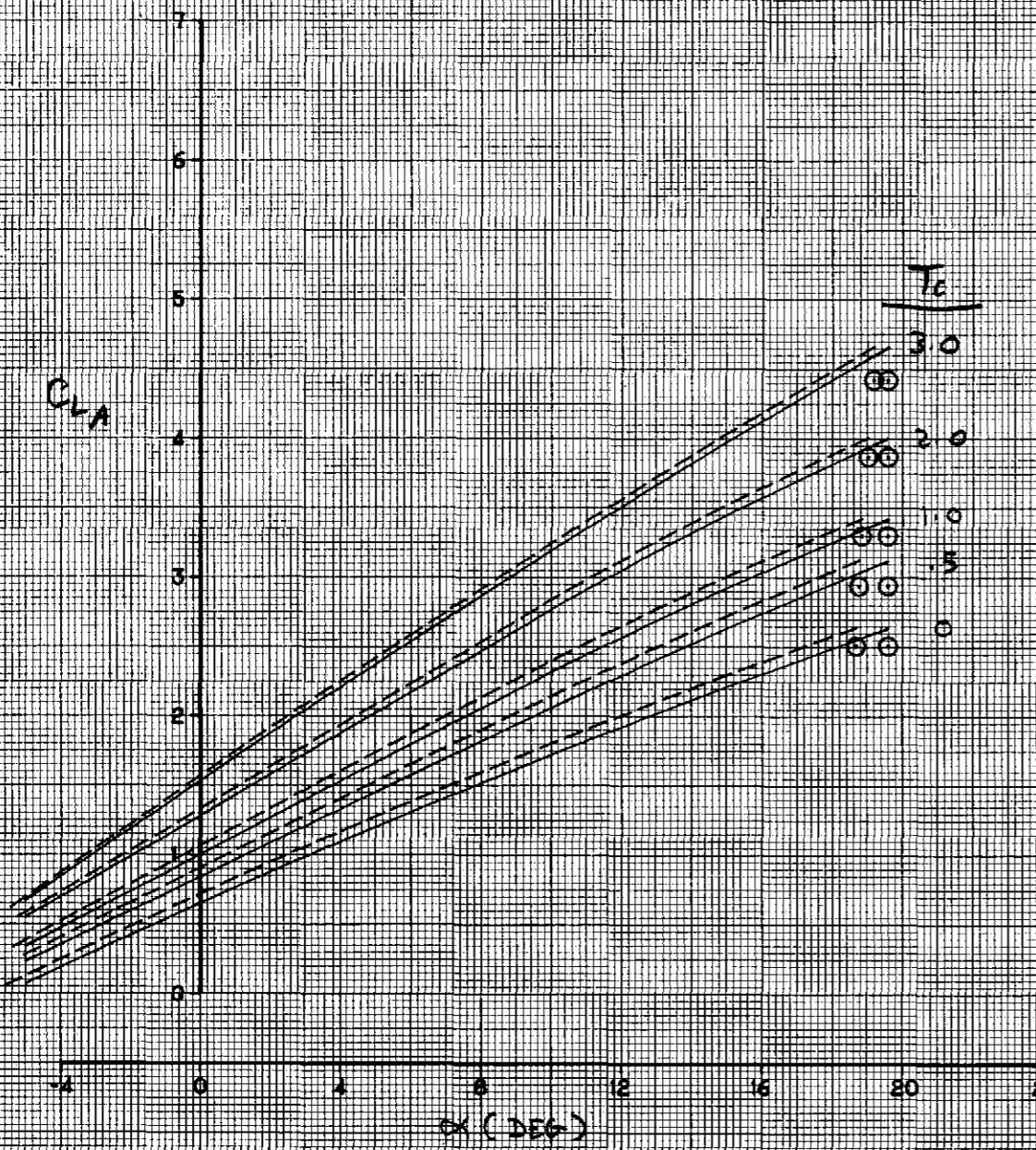
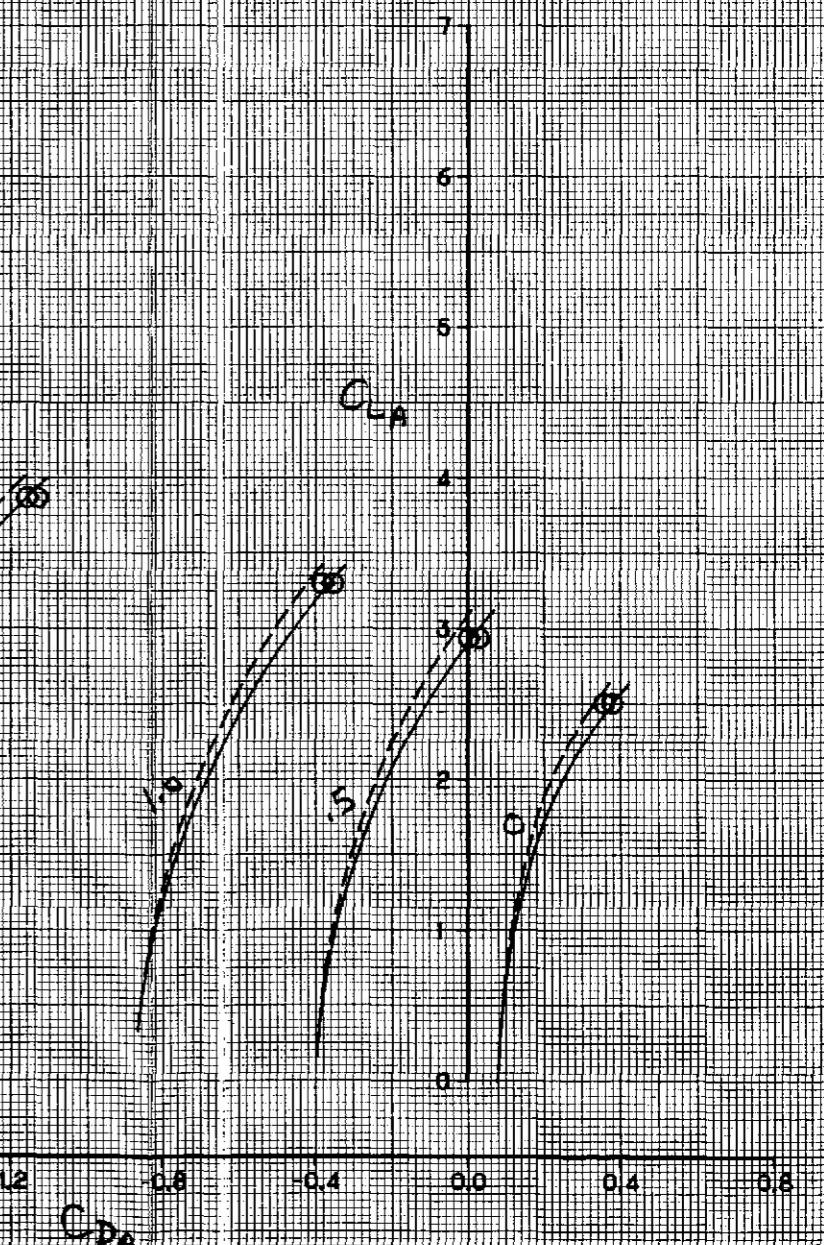


FIGURE A-14



A-22

FOLDOUT FRAME

DOUGLAS

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PREPARED BY:

REFERENCE

FOLDOUT FRAME

TURBOPROP HIGH-LIFT, ONE ENGINE, NOMINAL FLAP, 50°

ONE ENGINE OPERATING
FULL SPAN LEADING EDGE SLAT
GEAR DOWN, C.G. @ 25% C

$$\alpha = 22^\circ (\delta_f = 50^\circ)$$

LATERAL-DIRECTIONAL TRIM
ADDED SEPARATELY

Nominal Flap

AR = 9.0
AR = 10.5

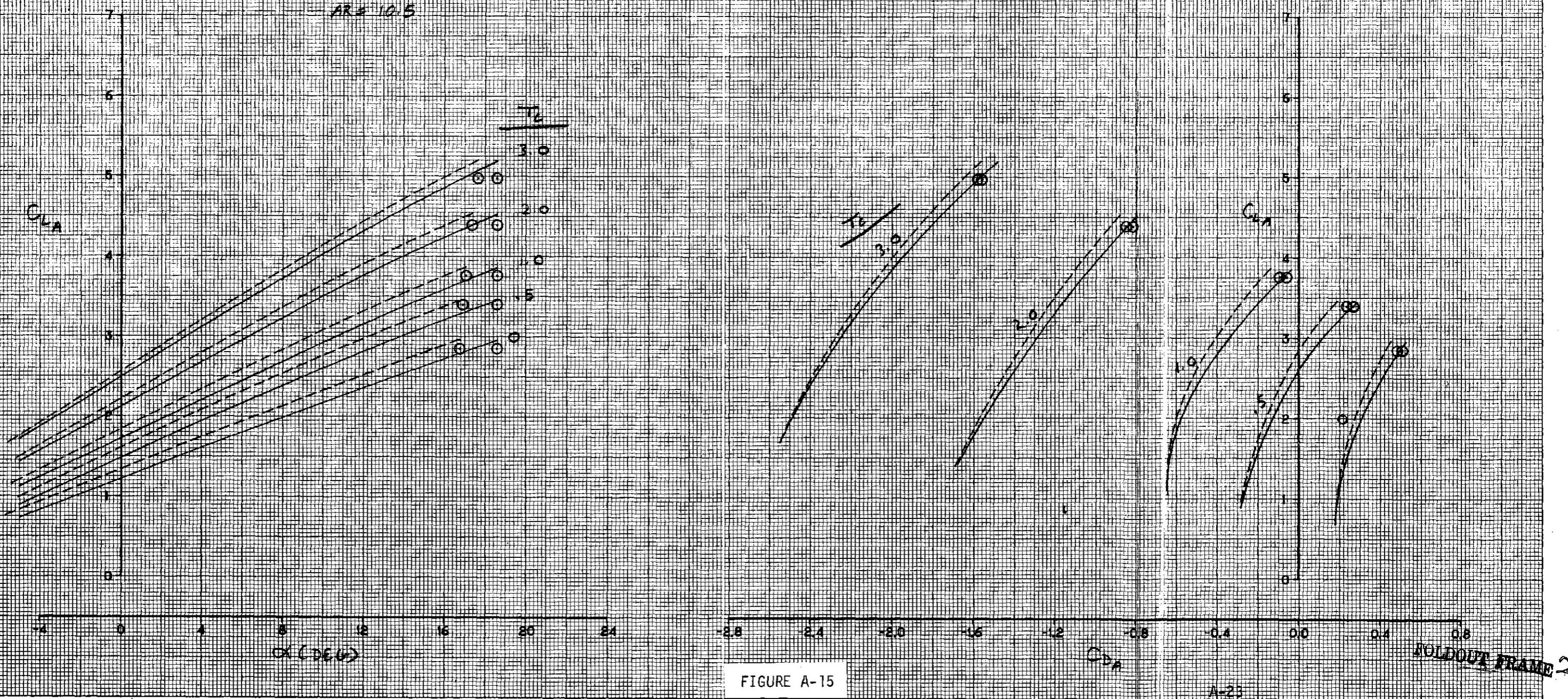


FIGURE A-15

TABLE A-4
SIMPLE HIGH LIFT SYSTEM, MAXIMUM LIFT COEFFICIENTS

FLAP ANGLE (degrees/radians)	$C_{LM_{1g}}$	$C_{LM_{V_{min}}}$
0/0	1.35	1.42
5/0.087	1.46	1.59
15/0.262	1.64	1.79
25/0.436	1.82	1.93
50/0.873	2.15	2.28

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DATE: 9/10/74
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ADVANCED HIGH LIFT SYSTEM

SUPER CRITICAL WING NOT REPRESENTED

(CF/C) NESTED $\approx .35$

$\delta_F = 5^\circ$

$\delta_F = 15^\circ$

$\delta_F = 25^\circ$

$\delta_F = 45^\circ$

0 10 20 30 40 50 60 70 80 90 100
PERCENT WING CHORD

FOLDOUT FRAME

FIGURE A-16

A-25

12158.1C.114

FOLDOUT FRAME

4. A 15% chord full-span leading-edge slat is provided to prevent flow separation at high angles of attack.

The low-speed aerodynamic characteristics used for the advanced flap high-lift systems are similar to that described above. The effects of Reynolds number on maximum lift coefficient were based on comparisons of low Reynolds number wind tunnel test data and flight test data for the basic DC-9 configurations. Douglas-developed analytical and empirical methods were used to adjust the DC-9 based data to the lower 5 degrees (0.087 rad) quarter chord sweep.

Figure A-17 shows the estimated out-of-ground effect longitudinally trimmed lift and drag characteristics for the advanced flap aircraft. The maximum lift coefficients for determining l_g and V_{min} stall speeds are presented in tableA-5 . The estimated engine-out lateral-directional trim increments used in the performance analysis are based on the methods as used for the nominal high-lift system.

A.2.1.5 Ground Effects

Empirical methods based on DC-9 wind tunnel and flight test data were used to estimate lift and drag increments due to ground effect as aircraft height changed. The empirical curves of the type used are presented in figuresA-18 andA-19. Figures A-20 and A-21 present the in-ground-effect high-lift data for the advanced and nominal high-lift systems with main gear on the ground.

A.2.2 High-Speed Aerodynamic Characteristics

The cruise drag characteristics for the configurations have been estimated by the well-established Douglas drag prediction procedure for transport aircraft. The cruise drag consists of zero-lift parasite drag and the drag due to lift at Mach numbers below those at which compressibility effects exist, plus the drag due to compressibility. The zero-lift parasite drag and the drag due to lift are evaluated at 0.5 Mach number, but at the Reynolds number corresponding to the

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ADVANCED FLAP

TRIMMED LIFT AND DRAG CHARACTERISTICS
FULL SPAN LEADING EDGE SLAT
ADJUSTED TO FLT. REYNOLDS NO.
GEAR DOWN, C.G. = .25 MAC
BASELINE, 50 PASSENGER

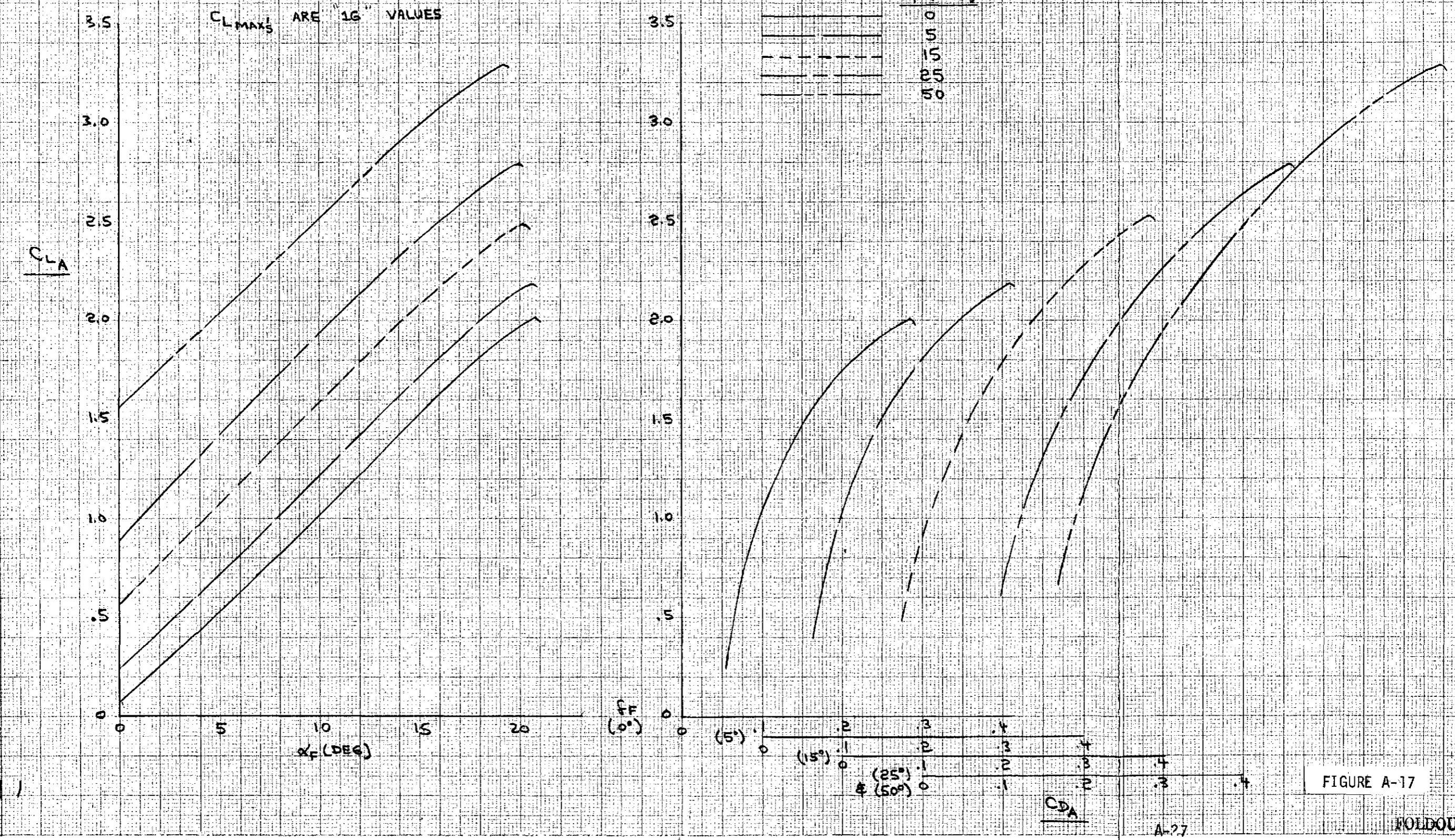


TABLE A-5
ADVANCED HIGH LIFT SYSTEM, MAXIMUM LIFT COEFFICIENTS

FLAP ANGLE (degrees/radians)	$C_{LM_{1g}}$	$C_{LM_{vmin}}$
0/0	2.01	2.08
5/0.087	2.19	2.32
15/0.262	2.49	2.64
25/0.436	2.79	2.90
50/0.873	3.29	3.42

~~DOUGLAS~~HEIGHT CORRELATION FACTOR FOR
LIFT IN GROUND EFFECT

$$C_L \cdot \text{Ground Effect} = C_L + K_L (C_L - F_L) \quad \text{Gear On Ground}$$

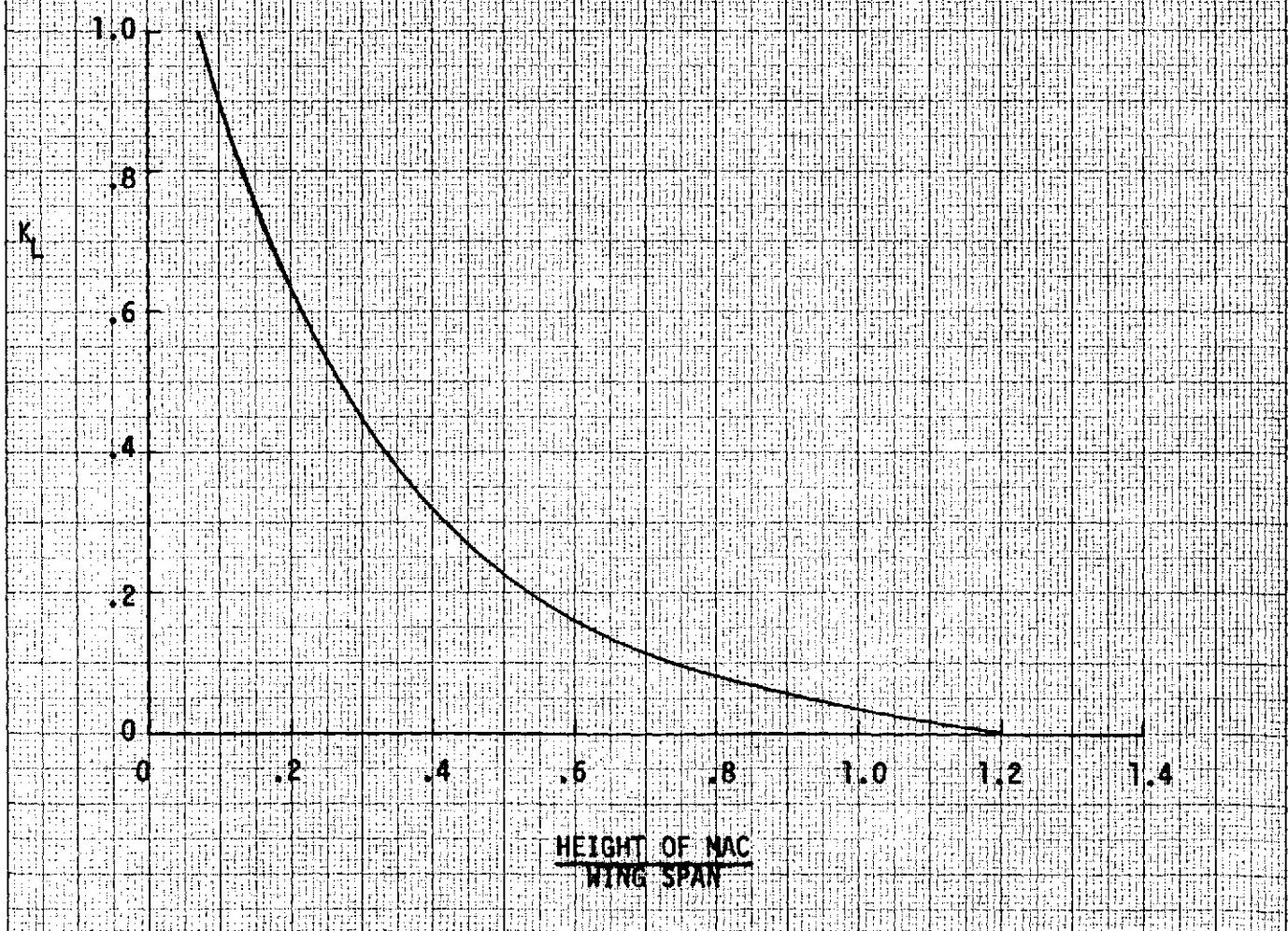
HEIGHT OF MAC
WING SPAN

FIGURE A-18

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~~DOUGLAS~~HEIGHT CORRELATION FACTOR FOR
DRAG IN GROUND EFFECT C_L^2

$$C_D \text{ Due to Ground Effects} = -K_D \frac{C_L^2}{\pi e R}$$

$$C_D \text{ Ground } = C_{D_0} + \frac{C_L^2}{\pi e R} (1 - K_D)$$

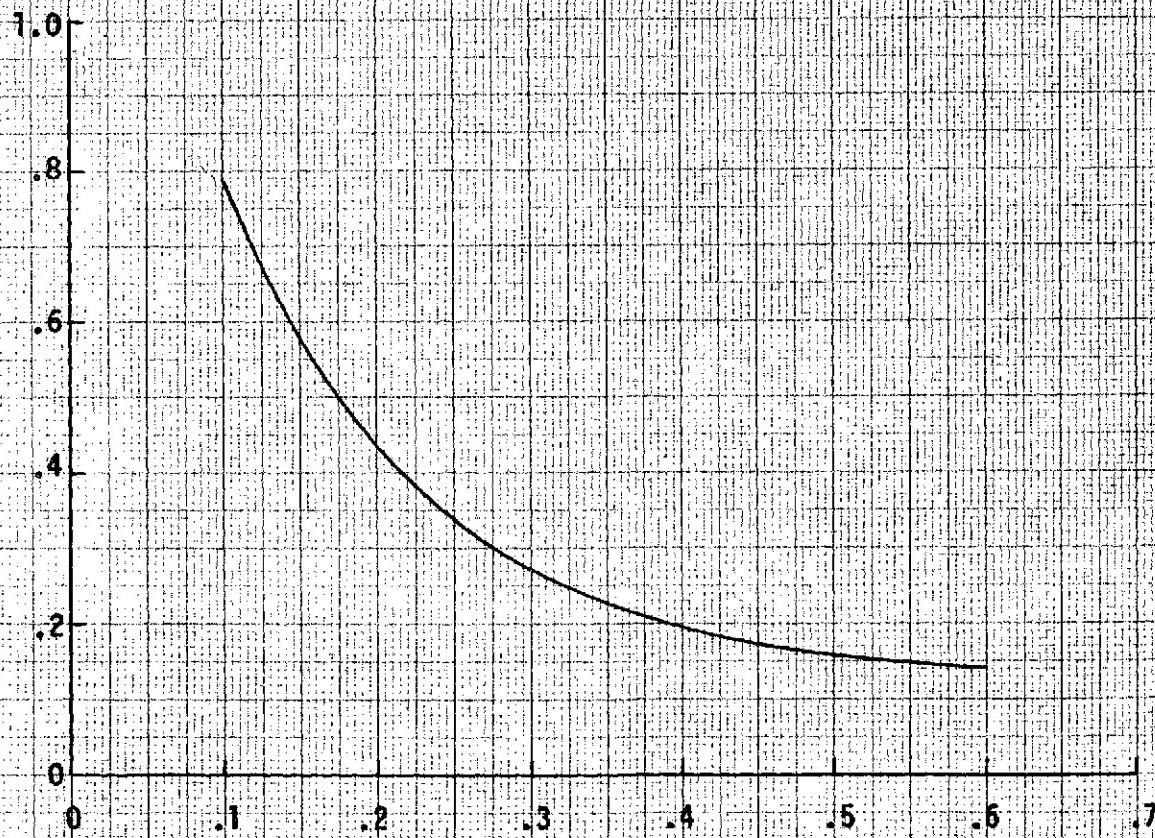
HEIGHT OF MAC
WING SPAN

FIGURE A-19

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REPORT NO. _____

**ADVANCED FLAP MODEL
LIFT CHARACTERISTICS IN GROUND EFFECT
MAIN GEAR ON GROUND, C.G. AT 0.25 MAC**

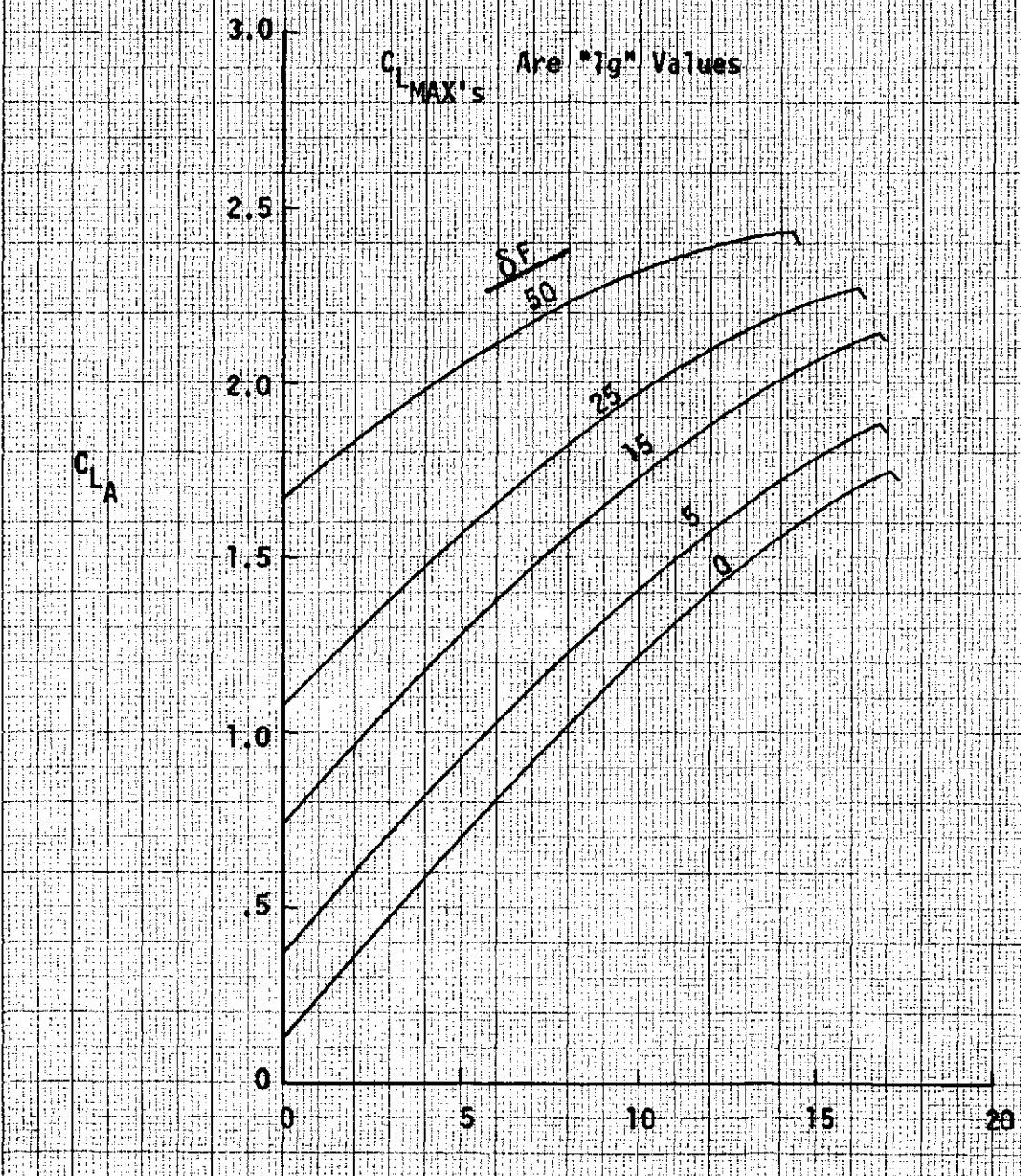


FIGURE A-20



NOMINAL FLAP MODEL
LIFT CHARACTERISTICS IN GROUND EFFECT
MAIN GEAR ON GROUND, C.G. AT 0.25 MAC

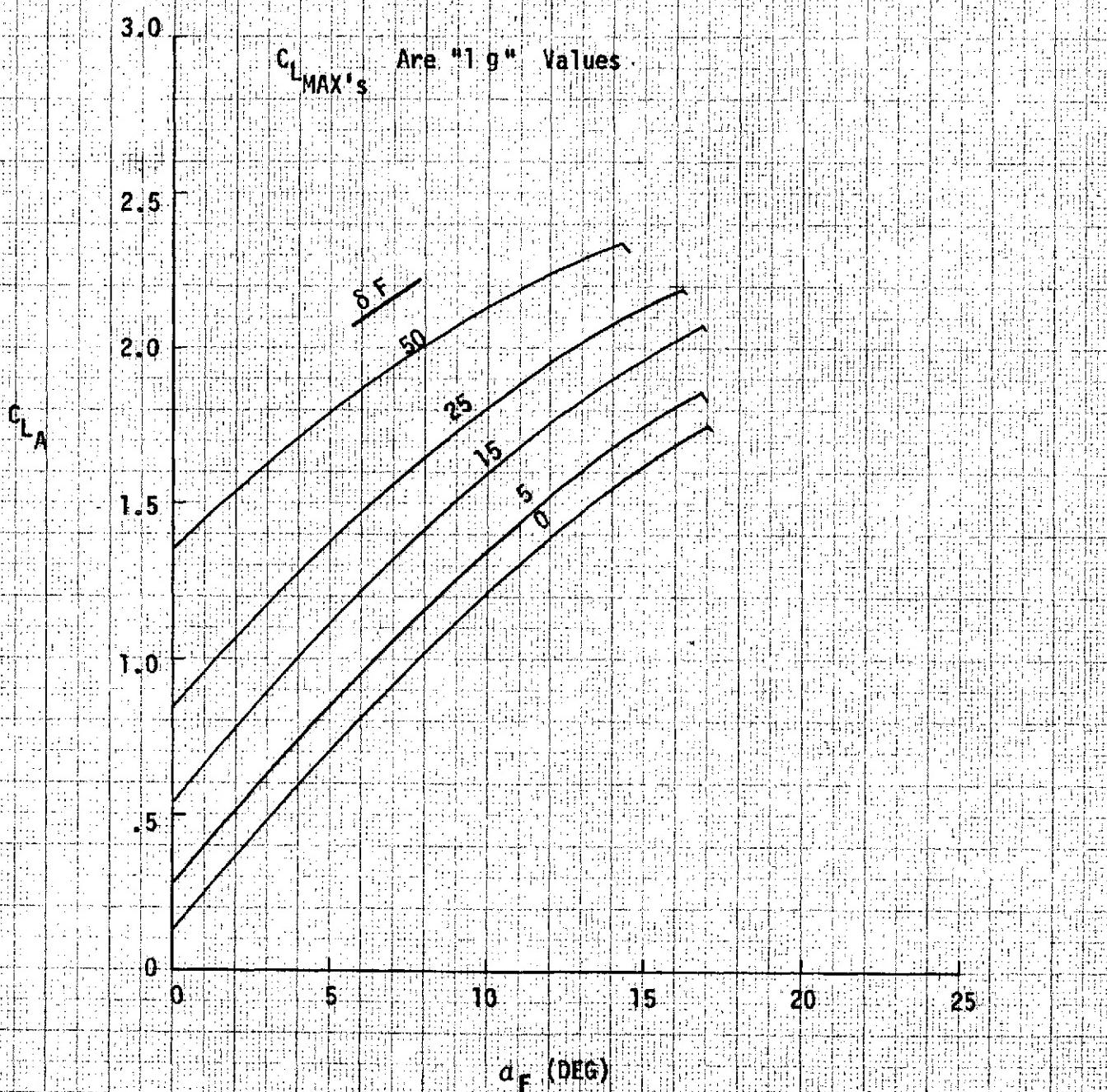


FIGURE A-21

design cruise points; in this way, the compressibility drag, which accounts for any drag increase at Mach numbers above 0.5, does not include a Reynolds number variation with Mach number.

A breakdown of the estimated zero-lift parasite drag and efficiency factor for the basepoint aircraft, section 7.2, are shown in table A-6 . The total estimated trimmed cruise configuration drag characteristics (zero-lift parasite, lift dependent, and compressibility drag) for this aircraft are shown in figure A-22 for a range of lift coefficients and Mach numbers.

TABLE A-6
LOW SPEED DRAG BREAKDOWN-BASEPOINT AIRCRAFT

50 Passenger Capacity

4500 ft (1372m) Field Length

1x850 n.mi. (1x1574km) Stage Length

Item	Equivalent Parasite Drag Area, $D/q_\infty \text{-ft}^2 (\text{m}^2)$	
Fuselage		
Friction, Form, Roughness	3.72	(0.346)
Canopy	0.18	(0.017)
Aft Fuselage Upsweep	0.22	(0.020)
Wing		
Friction, Form, Roughness	3.09	(0.287)
Flap Hinge Fairing	0.15	(0.014)
Horizontal Tail		
Friction, Form, Roughness	1.00	(0.093)
Elevator Hinge Fairings	0.05	(0.005)
Vertical Tail		
Friction, Form, Roughness	0.81	(0.075)
Nacelles and Pylons		
Friction, Form, Roughness	0.90	(0.084)
Subtotal	10.12	(0.941)
Miscellaneous Drags		
Excrescences, 7.1% of Subtotal	0.72	(0.067)
Air Conditioning, 0.7% of Subtotal	0.07	(0.007)
Control Surface Gaps	0.14	(0.013)
Contingency (5% of non-nacelle items)	0.51	(0.047)
Total Parasite Drag	11.56	(1.075)
Induced Drag Efficiency Factor	0.789	

~~DOUGLASS~~

ESTIMATED CRUISE CONFIGURATION DRAG CHARACTERISTICS

BASEPOINT AIRCRAFT

50 PASSENGERS

4500 FT (1372 M) FIELD LENGTH

1 x 850 N.MI. (1574 KM) STAGE LENGTH

BPR 6 ENGINES

$$S_{W,REF} = 464 \text{ FT}^2$$

AIRPLANE DRAG COEFFICIENT, C_D

.040

.035

.030

.025

.020

C_D

.40

.35

.30

.25

.20

.75

FREESTREAM MACH NUMBER, M_∞

FIGURE A-22

A.3 PAYLOAD VS RANGE: FINAL DESIGN BASEPOINT

Figure A-23 is a graph showing the payload-range performance of this aircraft. At the design range of 850 nautical miles, the fuel required is 9,090 pounds including reserves. The fuel capacity of the wing (center section and outer panel) is 10,400 pounds, which provides a range of 1025 nautical miles at a payload of 8700 pounds. The addition of small belly tanks (1650 pounds requiring 34 ft^3) increases the range to 1250 nautical miles at a payload of 7050 pounds. The maximum space limited payload is composed of 50 passengers and baggage, plus 50 ft^3 of freight. Baggage and freight is assumed to weigh $10 \text{ lb}/\text{ft}^3$. The weight limited payload is 54 passengers and baggage or 10,800 pounds, using a 29 inch seat pitch.

A.4 CURRENT AND PROPOSED AIRCRAFT

A.4.1 Dimensional, Weight and Performance Data

Tables A-7 and A-8 contain data necessary to define these turboprop and turbofan aircraft, respectively.

A.4.2 Payload, Block Fuel and Time vs Range

Figures A-24, A-25 and A-26 are graphs showing these performance characteristics for the turboprop aircraft. Figures A-27, A-28 and A-29 are graphs showing the same performance characteristics for the turbofan aircraft.

A.4.3 Three-View and Supporting Drawings

Table A-9 contains a list of drawings used in the Aircraft Requirements (Parametric), Design and Evaluation phases of this study.

DOUGLAS

FINAL DESIGN BASEPOINT
PAYLOAD-RANGE

CRUISE: 0.75M @ 25000 FT.

ADVANCED FLAP

- (1) DESIGN POINT: 4500 FT FIELD; 50 PSGR; 850 N. MI. RANGE
- (2) MAX. FUEL CAPACITY: WING TANKS ONLY (10,400 LB)
- (3) BELLY TANKS (1650 LB)

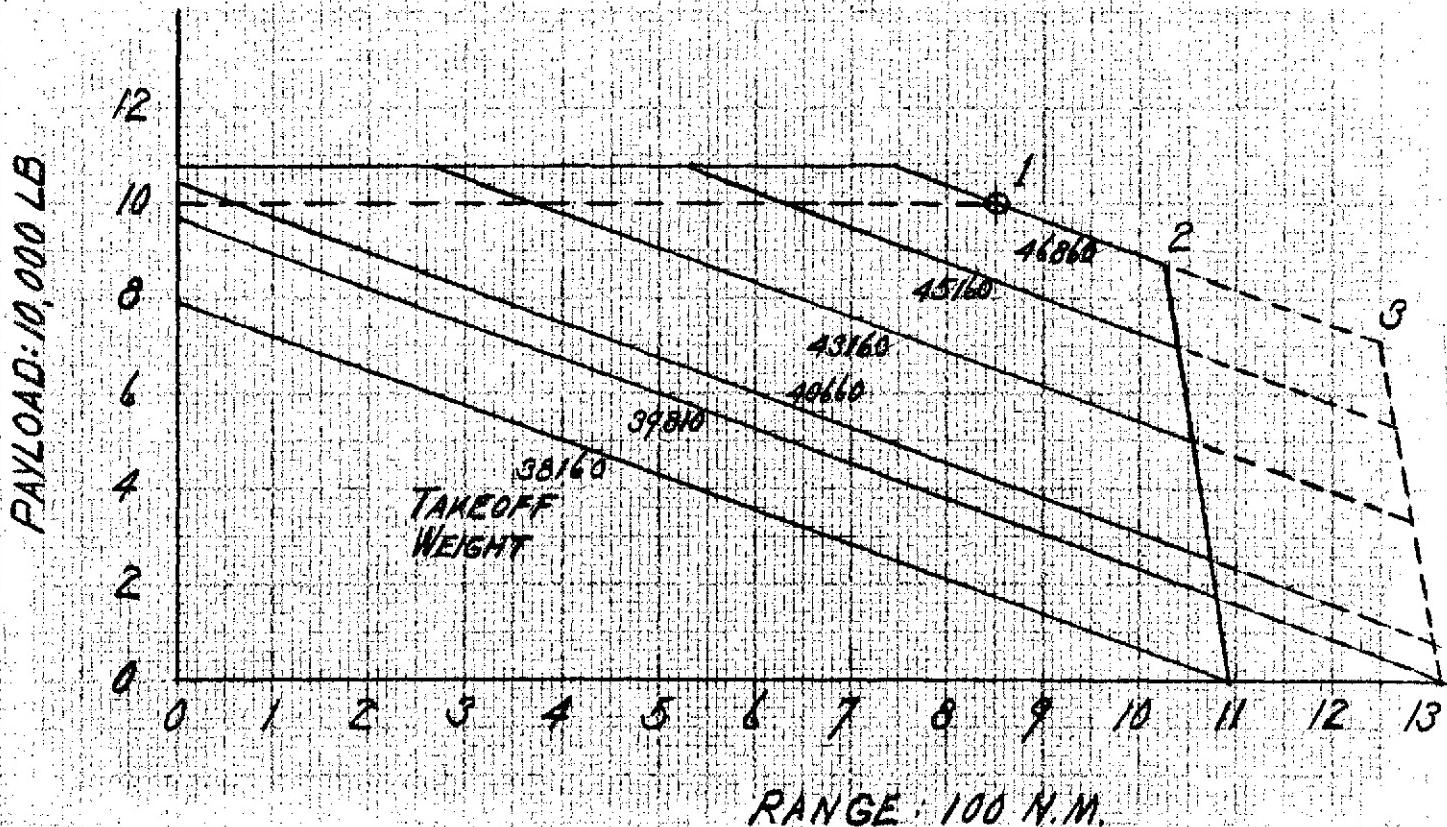


FIGURE A-23

TABLE A-7: CURRENT & EXISTING TURBOPROP AIRCRAFT

AIRCRAFT	Shorts SD 3-30	VFW-Fokker F27MK600	VFW-Fokker F27MK500	De Havilland DHC-7	General Dynamics CV580	Nihon YS11
Engine: Type/No Mounting Wing: Position	Turboprop(2) U' Wing, Snug High	Turboprop(2) U' Wing, Snug High	Turboprop(2) U' Wing, Snug High	Turboprop(2) U' Wing, Snug High	Turboprop(2) O' Wing, Snug Low	Turboprop(2) O' Wing, Snug Low
Price: 1975 \$(10) ⁶	1.30					
Max. Takeoff Weight (lb)	21,700	43,346	45,000	41,000	53,200	50,265
Max. Zero Fuel Weight (lb)		37,500	39,500	35,500		
Max. Landing Weight (lb)	21,400	41,000	42,000	39,000	50,670	45,047
Oper. Weight Empty(psgr)(lb)	13,890	24,940	25,990	24,440		31,878
Mfgr's Weight Empty (lb)	13,290	22,744	23,536			
Cost Weight (lb)						
Max. Fuel Capacity (lb)	3,840	12,941	12,941	10,230	10,250	12,210
Max. Payload (lb)	7,500	12,560	13,510	11,060		11,907
Passenger Payload (lb)	6,000	8,827	11,235	9,120	10,400	10,318
No/No ABR/Pitch (in)	30/3/30	44/4/31-33	56/4/28.5	48/4/32	52/4/	52/4/38
Range: Psgr Payload (nm)	235/225	1,075	810	768	870	580
Cruise: Speed (LR/HS) (kn)	198	259	259	200	350	257
Altitude (ft)	10,000	20,000	20,000	15,000	15,000/20,000	20,000
Thrust/Weight: Takeoff						
Wing Loading: Takeoff (lb/ft ²)		59.7	55.7	47.7	71.0	49.4
Aspect Ratio	12.0	12.0	12.0	10.06	12.0	10.8
Sweep: 0.25 chord (deg)	0	0	0	3.5		3.0
Cabin: Diameter (in)	78	100.5	100.5	103.0		113.0
Length (ft)	31.1	47.4	52.4	40.0	39.8	47.3
Max Height (in)	78	79.5	79.5	78/73	79.0	80
Floor Width (in)	78	82.7	82.7	84.0	106.0	94
Vol: Cargo/Bagg. (ft ³)		297	297	286	402	335
Press. Diff (lb/m ²)					4.16	
FAR TOFL: Distance (ft)	3850(4300)	5480(6030)	4090(5320)	2200/2450	4,380	2,890
Weight (lb)	21,700	43,346	45,000	41,000		50,265
Condition	ISA(+15°C)	ISA(+15°C)	ISA(+15°C)	59°F/90°F		ISA
FAR Landing: Distance (ft)	3,320	3,290	3,290	2,050	4,256	3,790
Weight (lb)	21,000	36,000	36,000	39,000		48,047
Condition						
Noise: FAR 36;T.O.,LAT,(EPNdB) APPR.	85/90/95	89/93/99	89/93/99	80/82/82		
Engine: Company Model	P&W PT6A-45	R R Dart RDA7MK532-7R	R R Dart RDA7MK532-7R	P&W PT6A-50	Allison 501-D1S	R R Dart RDA 10/1
Rating: T0 (Lb/HP)	1,120	2,140+525	2,140+525	1,174	3,750	2,660
Propeller: Company Blade/Dia (no/ft)	Hartzell 5/9.0	Rotol 4/11.5	Rotol 4/11.5	Ham-Std 4/11.25	Aeroproducts 4/13.5	Rotol 4/14.5

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TABLE A-8: CURRENT & EXISTING TURBOFAN AIRCRAFT

AIRCRAFT	Dassault-Breguet Falcon 30 Turbofan(2) Aft Fuselage Low	VFW-Fokker VFW614 Turbofan(2) Overwing, Pylon Low	VFW-Fokker F28MK1000/5000 Turbofan(2) Aft Fuselage Low	VFW-Fokker F28MK2000/6000 Turbofan(2) Aft Fuselage Low	Hawker-Siddeley HS146-100 Turbofan(4) Underwing Pylon High	Hawker-Siddeley HS146-200 Turbofan(4) Underwing Pylon High
Engine: Type/No Mounting Wing: Position						
Price: 1975	\$ $(10)^{-6}$					
Max. Takeoff Weight	(lb)	35,275	44,000	65,000/70,800	65,000/70,800	72,000
Max. Zero Fuel Weight	(lb)	29,320	36,600	54,500	54,500/56,000	60,500
Max. Landing Weight	(lb)	32,190	44,000	59,000/64,000	59,000/64,000	70,000
Operating Weight Empty (Psgr)	(lb)	21,820	27,560	35,464/37,437	36,953/38,775	41,130
Manufacturers Weight Empty	(lb)		26,130	34,470/36,443	35,943/37,765	
Cost Weight	(lb)					
Max. Fuel Capacity	(lb)	9,350		16,982/22,736	16,982	17,850
Max. Payload	(lb)	7,500	9,040	19,036/17,063	17,547/17,225	19,370
Passenger Payload	(lb)	5,700	8,200/ 40-44/4/32-33	12,000	15,000	14,200
No./No. ABR/Pitch (in)		30/3/31		60/5/32-33	75/5/31-32	71/5/33
Range: Psgr Payload	(nm)	835				
Cruise: Speed (LR/HS)	(kn)	445	397	440	440	425
Altitude	(ft)	25,000	21,000/25,000			22,000
Thrust/Weight: Takeoff		0.344	0.340	0.303/0.278	0.303/0.278	0.361
Wing Loading: Takeoff	(lb/ft ²)	66.6	64.0	79.1/83.4	79.1/83.4	86.5
Aspect Ratio		6.58	7.22	7.27/8.00	7.27/8.00	9.00
Sweep: 0.25 Chord	(deg)	29.55	15.0	16.0	16.0	15.0
Cabin: Diameter	(in)	96.0	104.7	120.2	120.2	140.0
Length	(ft)	37.0	36.8	43.0	50.3	50.6
Max. Height	(in)	73.0	76.8	79.3	79.3	
Floor Width	(in)	72.5	90.			
Volume: Cargo/Bag	(ft ³)	220	194-114	460	557	517
Press. Diff.	(lb/in ²)	8.5	6.55	7.45	7.45	6.5
FAR TOFL: Distance	(ft)	5000(5180)	4,000	5,490/5,860	5,490/5,860	3,500
Weight	(lb)	35,275	44,000	65,000/70,800	65,000/70,800	72,000
Condition		SL,ISA(+10°C)		SL,ISA	SL,ISA	SL,ISA
FAR Landing: Distance	(ft)	4,000	3,600	3,540/3,120	3,540/3,120	
Weight	(lb)	32,190	44,000	59,000/64,000	59,000/64,000	
Condition						
Noise: FAR 36; T.O.,LAT., APPR. (EPNdB)			89/95/96	93/103/102	93/103/102	
Engine: Company Model Rating: T.O.	(lb/HP)	Avco-Lycoming ALF 502-D 6,070	R.R. Bristol SNECMA M45H-01 7,473	R.R. Spey MK555-15/15H 9,850	R.R. Spey MK555-15/15H 9,850	Avco-Lycoming ALF 502H 6,500
Propeller: Company Blade/Diam	(no/ft)	---	---	---	---	---

FOLDOUT FRAME 1

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TURBOPROP AIRCRAFT

15

4

3

2

10

9

8

7

6

5

4

3

2

1

0

DHC-7

F27 MK500

Y3-11

F27 MK600

F

SD 3-30

P

CV-580

RANGE: 100 N.M.

A-40

FIGURE A-24

DOUGLAS

RANGE: 100 N.M.

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TURBOPROP AIRCRAFT

15

14

13

12

11

10

9

8

7

6

5

4

3

2

1

BLOCK FUEL / 1000' B

A-41

SD 3-30

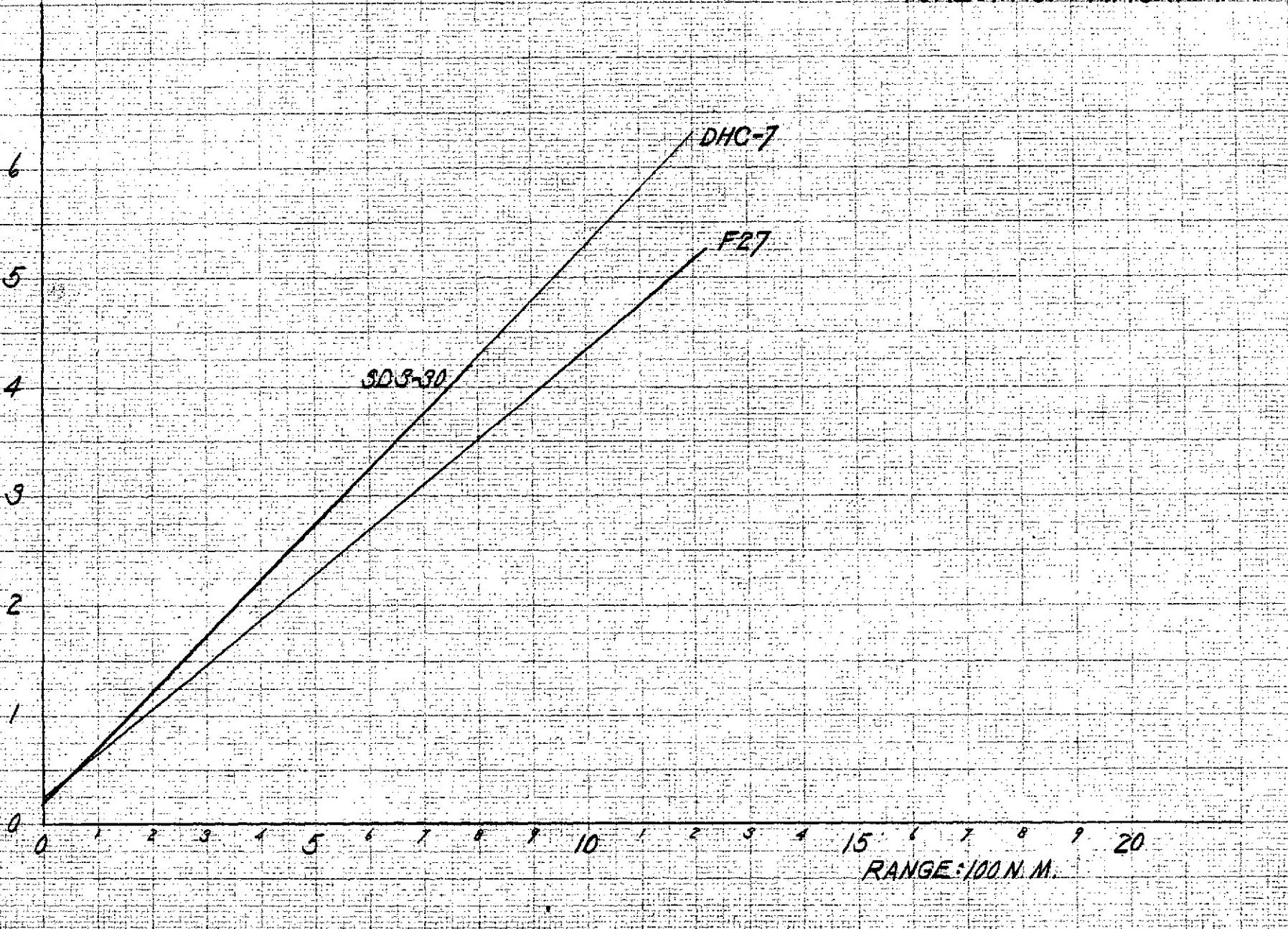
DHC-7

F27⁸⁰⁰
₆₀₀

RANGE: 100 N.M.

DOUGLAS

TURBOPROP AIRCRAFT



DOUGLAS

DOUGLAS

TURBOFAN AIRCRAFT

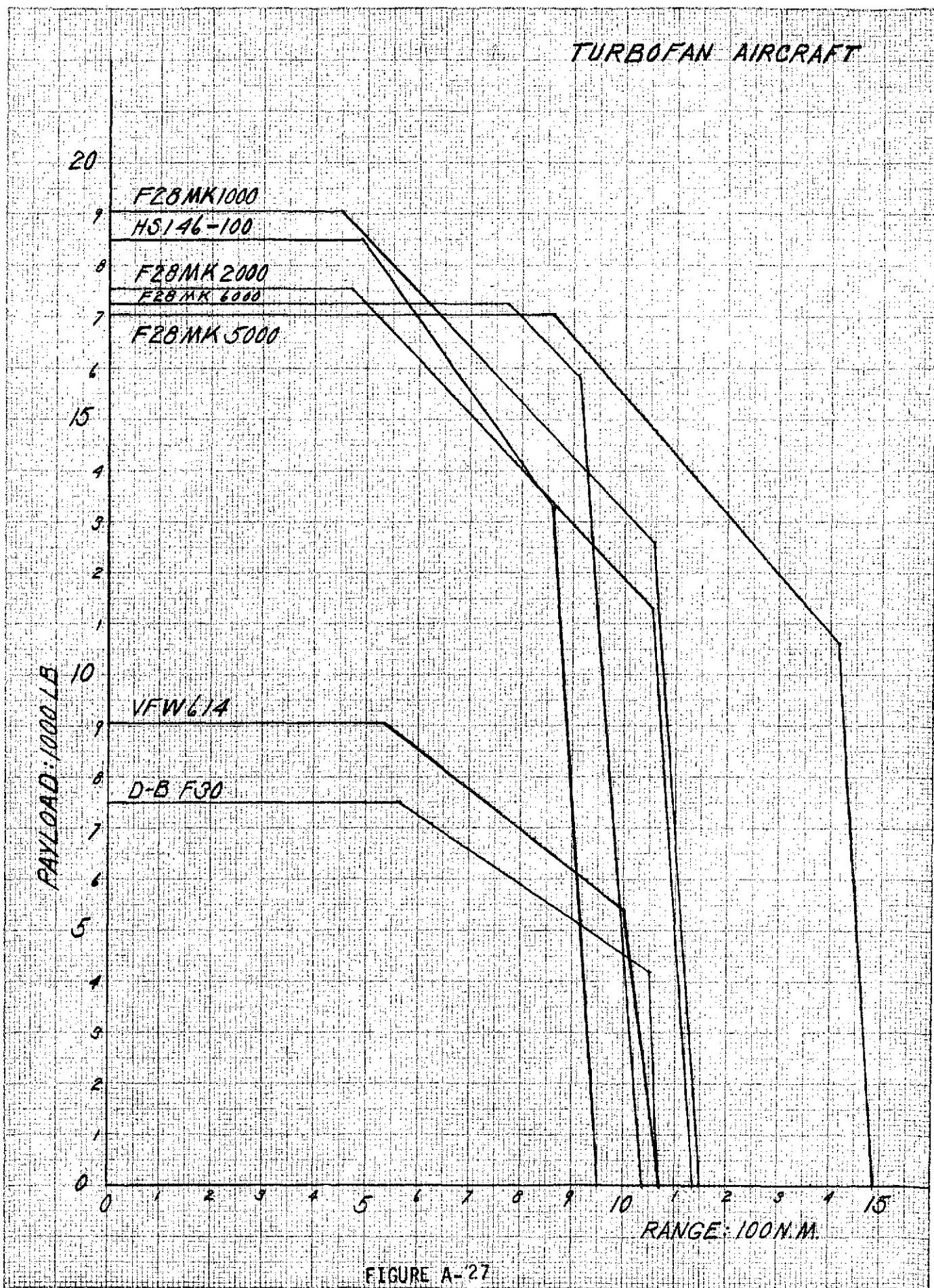
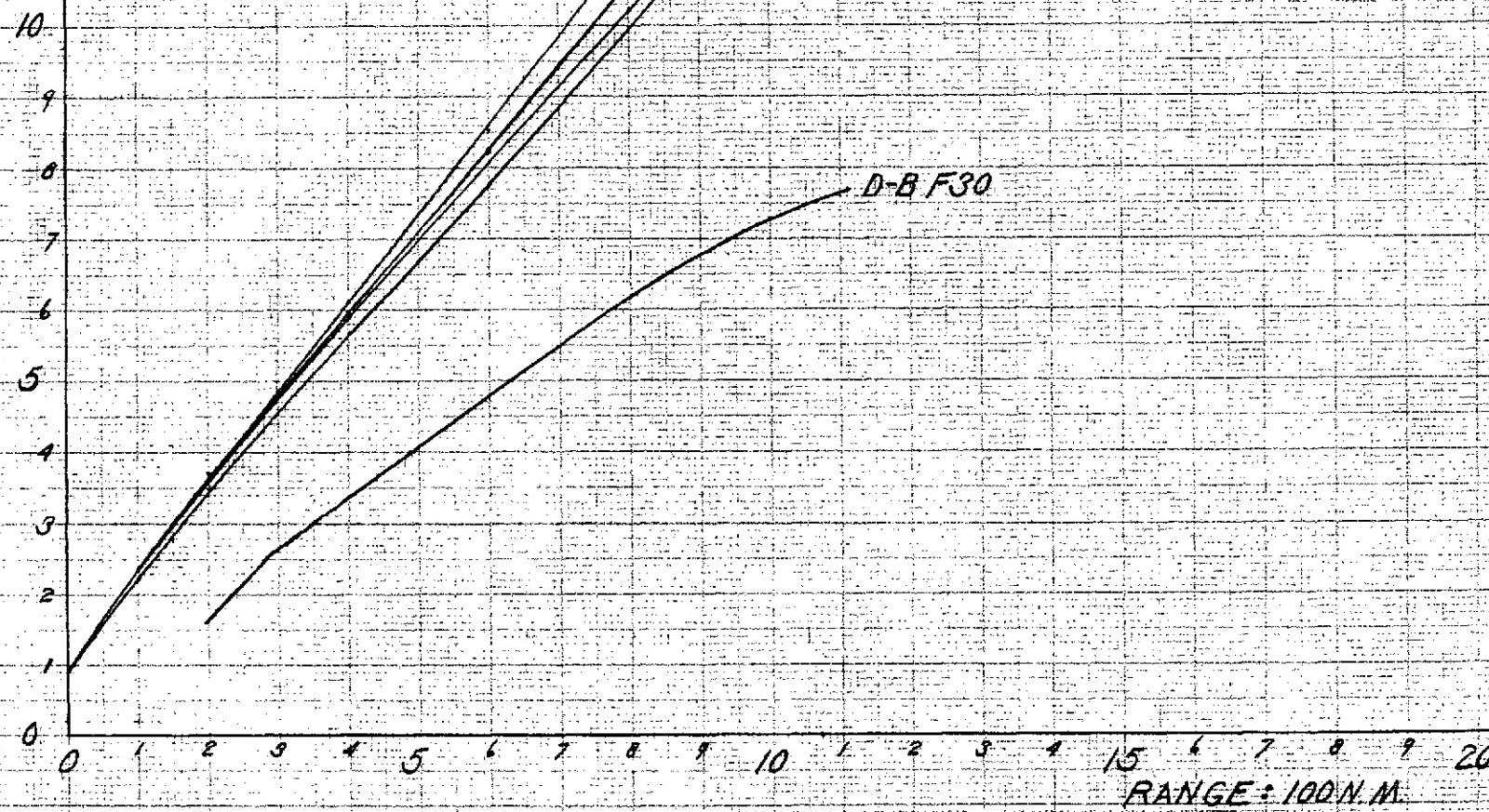


FIGURE A-27

TURBOFAN AIRCRAFT

F28 MK 6000/15000
F28 MK 2000/10000

D-8 F30



DOUGLAS

A-44

FIGURE A-28

3.0

2

1

0

2.0

1

0

1

0

1

0

1

0

0

1

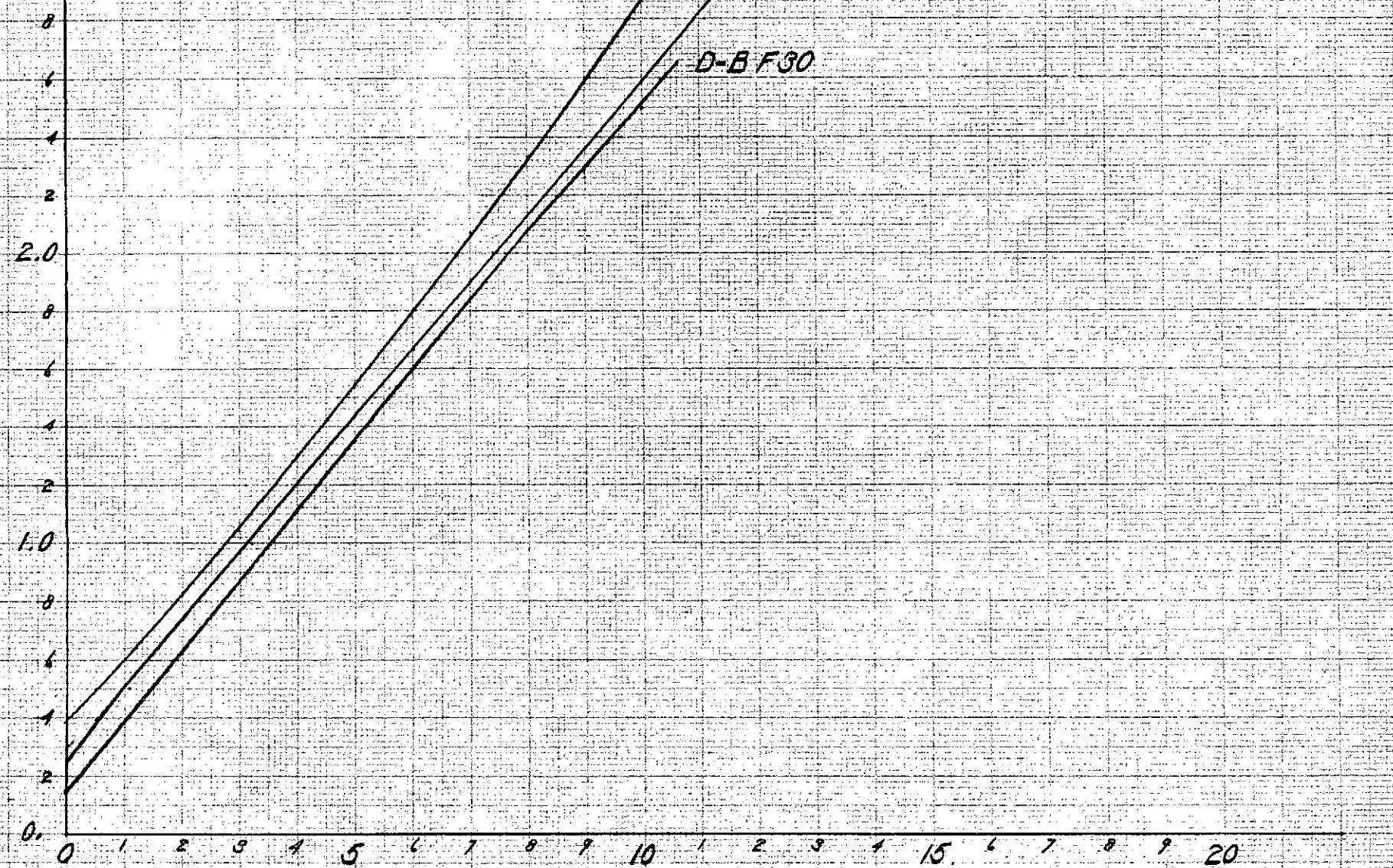
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VFW 614

F28

TURBOFAN AIRCRAFT

D-B F30



RANGE: 100 NM.

FIGURE A-29
A-45

Table A-9
THREE-VIEW & SUPPORTING DRAWINGS

DWG. NO. (Fig. No.)	TITLE	STUDY PHASE	DESCRIPTION			
			Psgr. (No.)	Field Length (Ft)	Range (N.Mi.)	Engine
J112133A (A-30)	General Arrangement (Baseline)	Parametric	50	4,500	2 x 250	F.P. Fan (2)
J112146 (A-31)	General Arrangement	Parametric	30	4,500	2 x 250	F.P. Fan (2)
J112148 (A-32)	General Arrangement	Parametric	70	4,500	2 x 250	F.P. Fan (2)
J112184 (A-33)	General Arrangement	Parametric	50	4,500	2 x 250	V.P. Fan (2)
J112141A (A-34)	General Arrangement	Parametric	50	4,500	2 x 250	Turboprop (2)
J112207A (A-35)	General Arrangement (Basepoint)	Design	50	4,500	1 x 850	F.P. Fan (2)
J112187A (A-36)	General Arrangement	Design	50	4,500	1 x 850	Turboprop (2)
J112219 (A-37)	General Arrangement	Design	50	4,500	1 x 850	Avco-Lycoming (4) ALF502
J112248 (A-38)	General Arrangement (Shrink)	Design & Evaluation	42	<4,500	--	F.P. Fan (2)
J112249 (A-39)	General Arrangement (Str/Shr. Base)	Design & Evaluation	50	4,500	1 x 850	F.P. Fan (2)
J112250 (A-40)	General Arrangement (Stretch)	Design & Evaluation	70	>4,500	--	F.P. Fan (2)
J112239 (A-41)	Fuselage Study (Stretch/Shrink)	Design & Evaluation				
J112128B (A-42)	Fuselage Cross Section (Cusped)	Design & Evaluation				
J112220 (A-43)	Alt. Body Section (Circular)	Design & Evaluation				
J112139 (A-44)	Fwd. Engine Arrangements	Design & Evaluation				

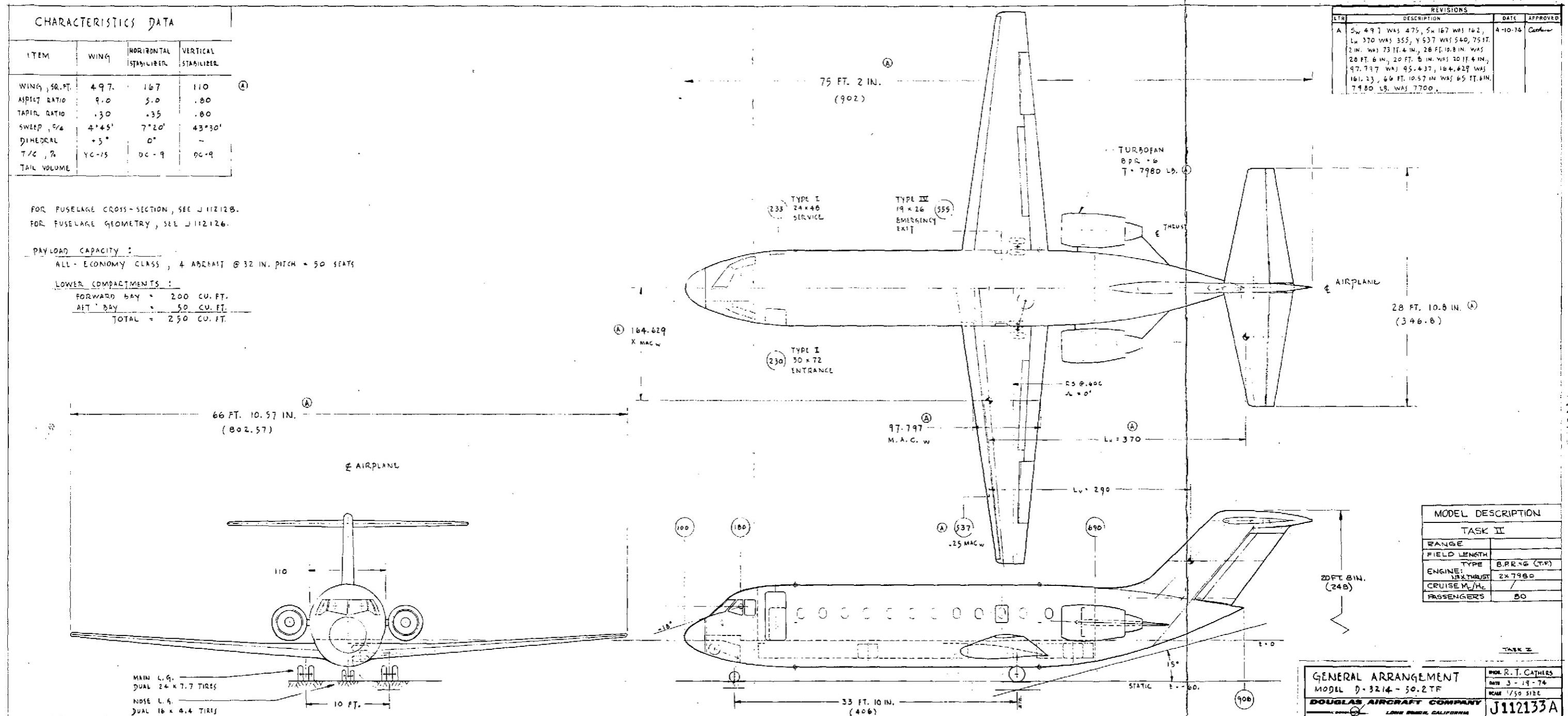


FIGURE A-30

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CHARACTERISTICS		DATA	
ITEM	WING	H. TAIL	V. TAIL
AREA, FT ²	363.3	128	83
ASPECT RATIO	9.0	5.0	.80
TAPER RATIO	.30	.35	.80
SWEEP	4°45'	7°20'	43°30'
DIHEDRAL	5°	0°	~
T/C	YC-15	DC-9	DC-9
TAIL VOLUME	~	1.27	.08

FOR FUSELAGE CROSS-SECTION, SEE J112128.

FOR FUSELAGE GEOMETRY, SEE J112125.

PAYLOAD CAPACITY

ALL-ECONOMY CLASS = 4 ABOARD @ 32 IN. PITCH = 30 SEATS.

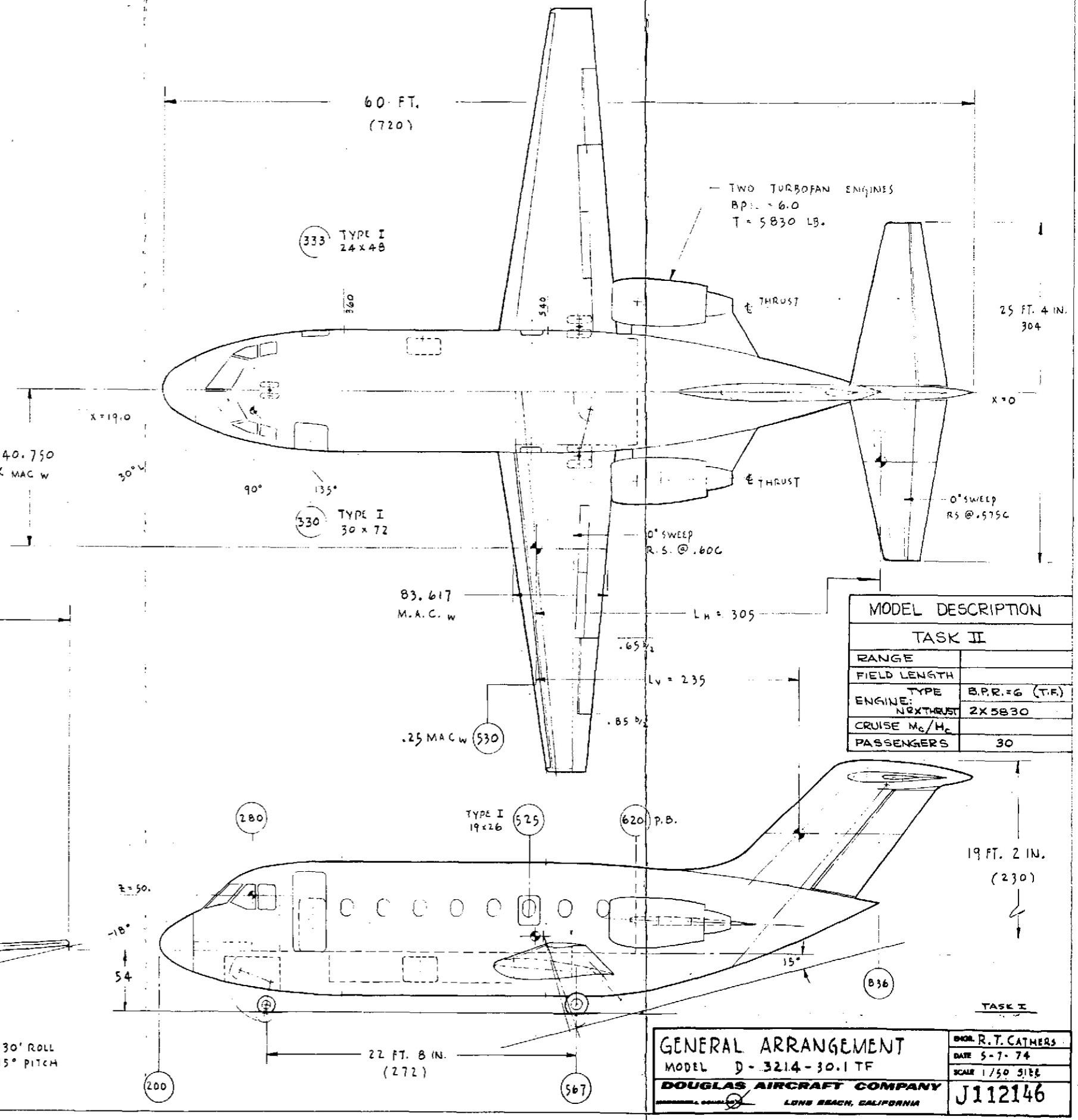
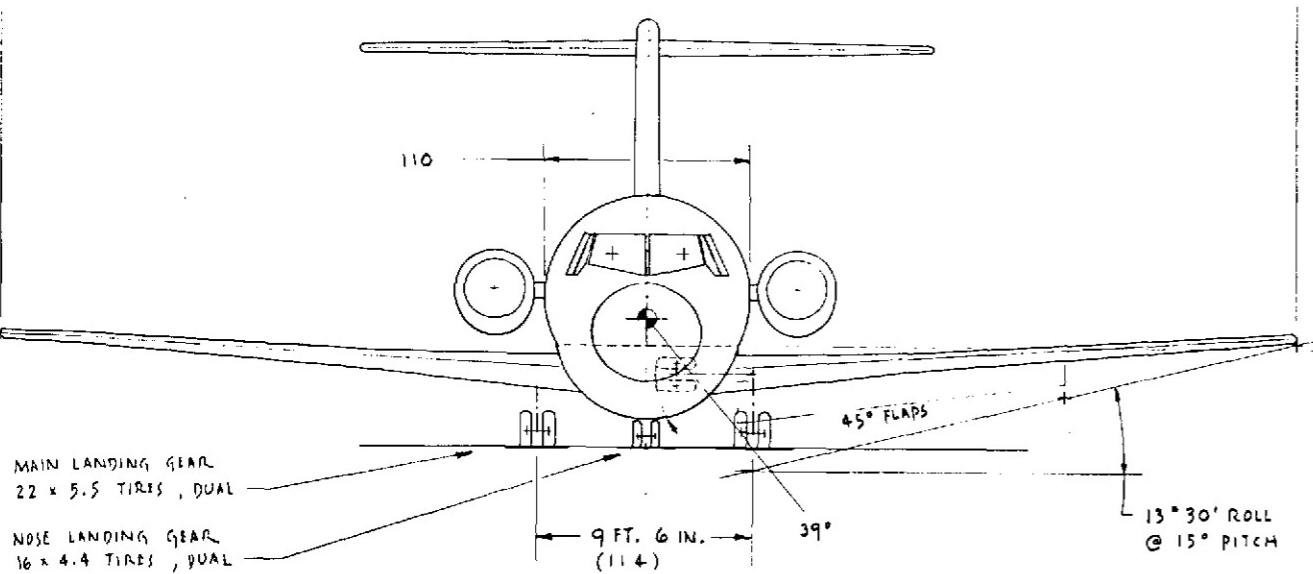
CARGO VOLUME

FORWARD LOWER BAY = 110 CU. FT.

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57 FT. 2.16 IN.
(686.16)

AIRPLANE



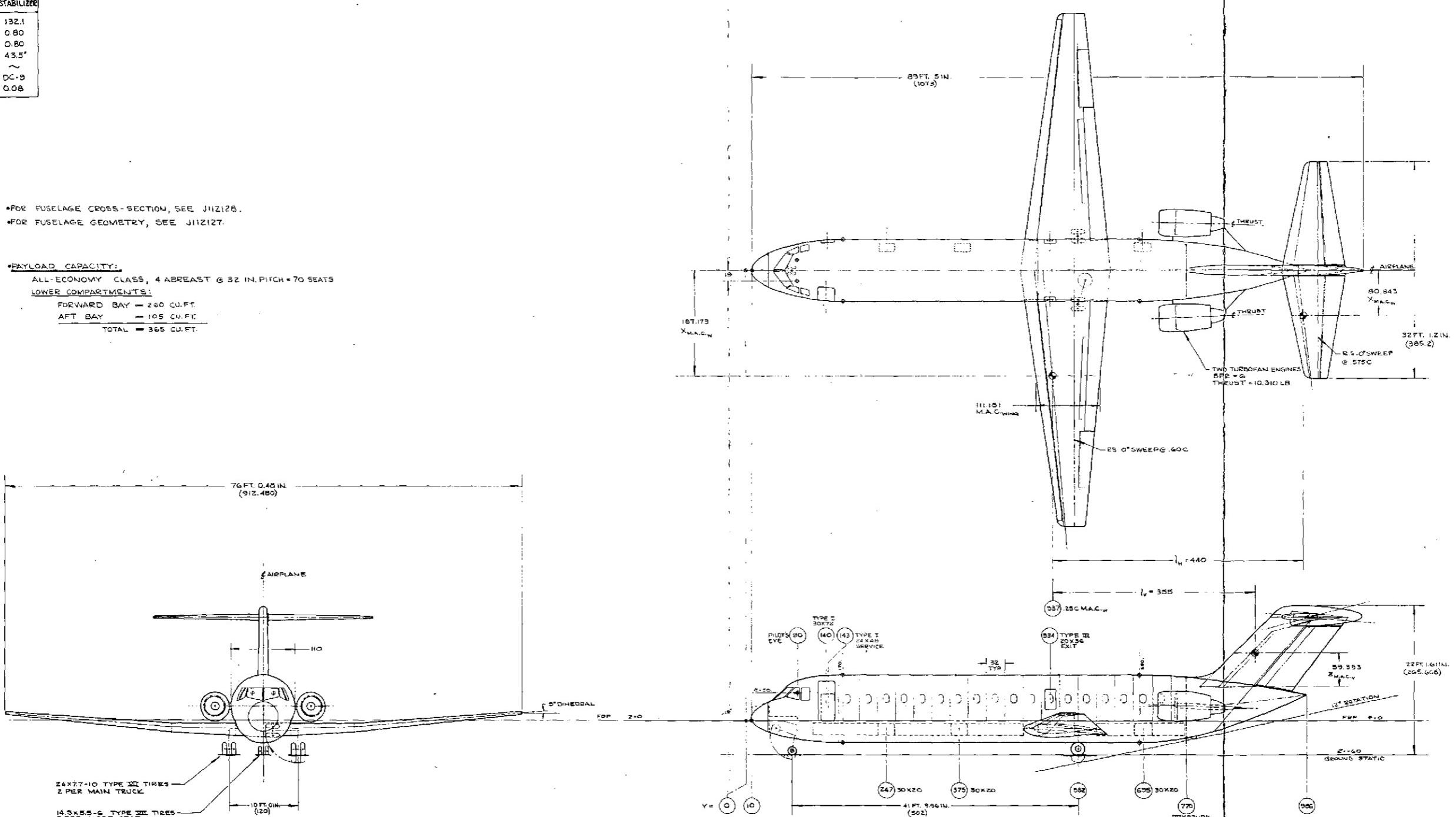
FOLDOUT FRAME FIGURE A-31

CHARACTERISTICS DATA			
ITEM	WING	HORIZONTAL STABILIZER	VERTICAL STABILIZER
WING, SQ. FT.	642.4	206.2	132.1
ASPECT RATIO	9.0	5.0	0.80
TAPER RATIO	0.30	0.35	0.80
SWEEP, $\frac{1}{4}$	4° 53'	745'	43.5°
DIMEDRAL	+5°	0°	~
T/E, %	YC-15	DC-9	DC-9
TAIL VOLUME	~	1.27	0.08

- FOR FUSELAGE CROSS-SECTION, SEE JI12128.
- FOR FUSELAGE GEOMETRY, SEE JI12127.

*FOR FUSELAGE GEOMETRY, SEE J11212.

PAYOUT LOAD CAPACITY:
ALL-ECONOMY CLASS, 4 ABREAST & 32 IN. PITCH = 70 SEATS
LOWER COMPARTMENTS:
FORWARD BAY = 260 CU.FT.
AFT BAY = 105 CU.FT.
TOTAL = 365 CU.FT.



MODEL DESCRIPTION	
TASK II	
RANGE	
FIELD LENGTH	
ENGINE:	TYPE: B.P.R. = 6 (TR)
	MAX TORQUE
CRUISE M./H.	2 KIO, 310 LB

GENERAL ARRANGEMENT
MODEL D-3214-70.1 TF
DOUGLAS AIRCRAFT COMPANY

PRINT A. J. TESTA
DATE 5-10-74
ITEM 1/50 SIZE

J 112148

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OLDOUT FRAME

FIGURE A-32

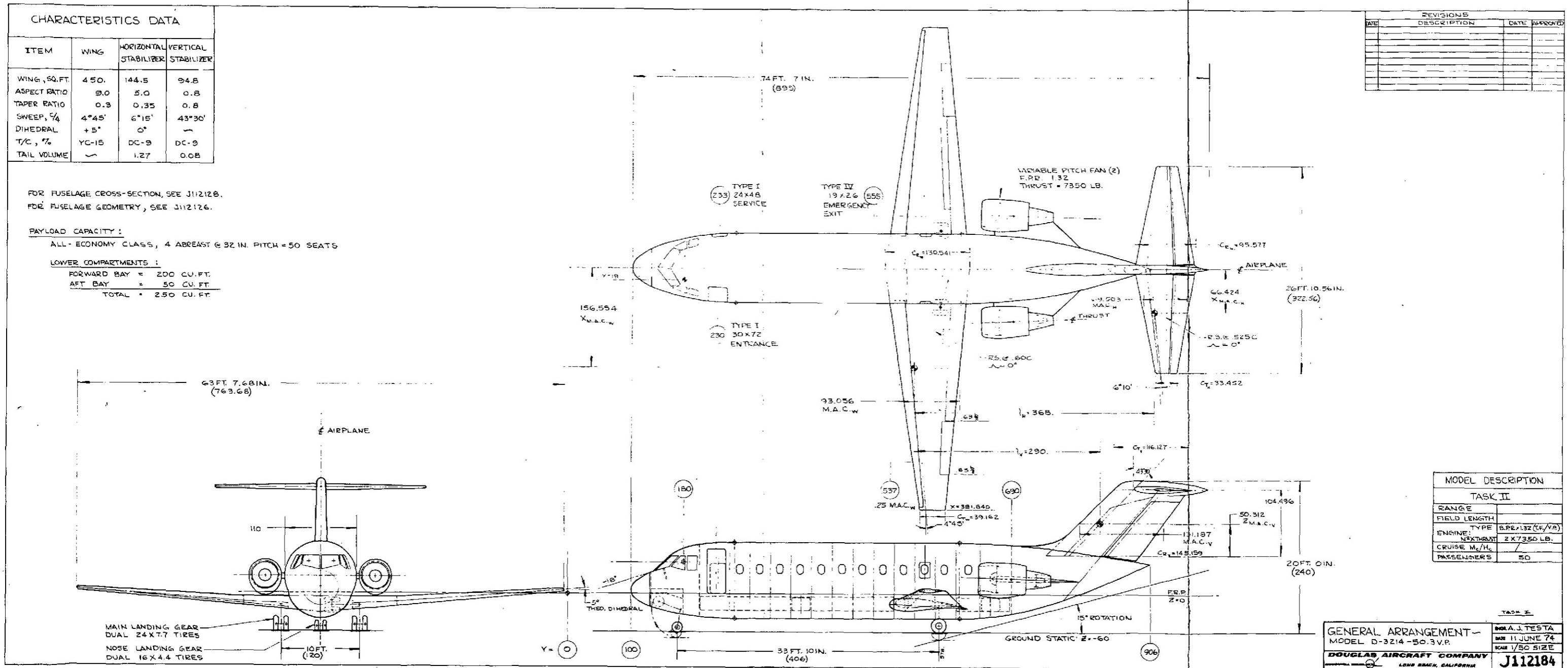


FIGURE A-33

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FOLDOUT FRAME

CHARACTERISTICS DATA			
ITEM	WING	HORIZONTAL STABILIZER	VERTICAL STABILIZER
AREA, SQ. FT.	497	170	110
ASPECT RATIO	9.0	5.0	1.60
TAPER RATIO	.30	.35	.35
SWEEP	4° 45'	7° 20'	30°
DIHEDRAL	5°	5°	~
TAIL VOLUME		1.27	.12

FOR FUSELAGE CROSS - SECTION, SEE J11212 B.
FOR INTERIOR ARRANGEMENT, SEE SHEET II.

PAYLOAD CAPACITY:
ALL-ECONOMY CLASS, A ABRENT @ 32 IN. PITCH = 50 SEATS

LOWER COMPARTMENTS:

FORWARD BAY = 150 CU. FT.
AFT BAY = 100 CU. FT.
TOTAL = 250 CU. FT.

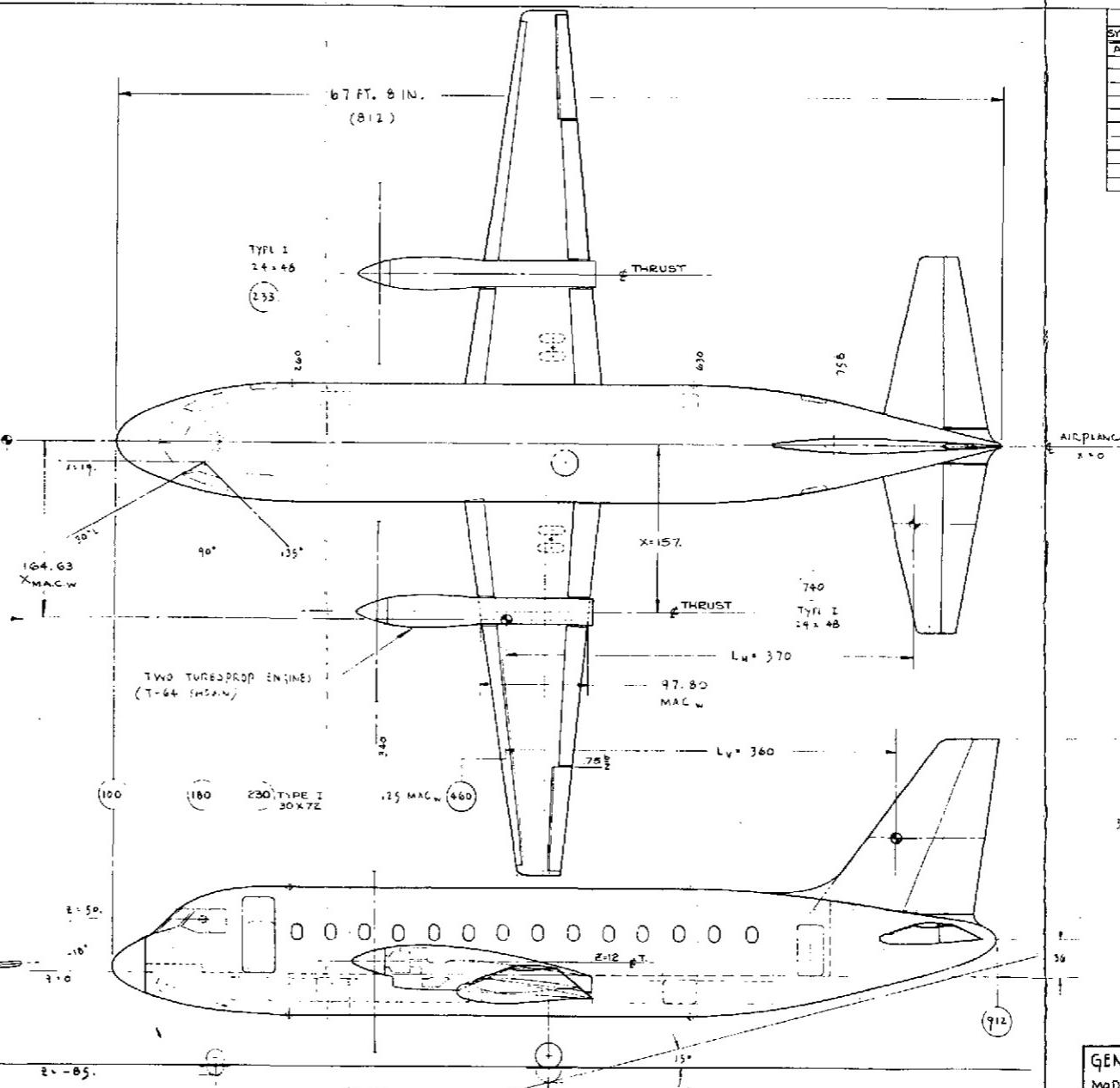
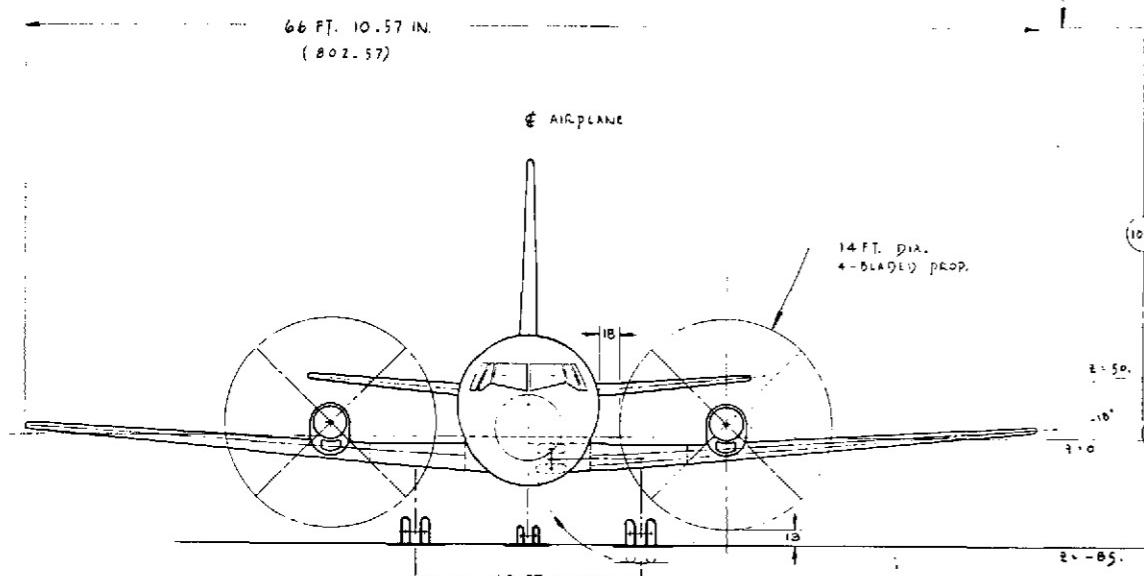


FIGURE A-34

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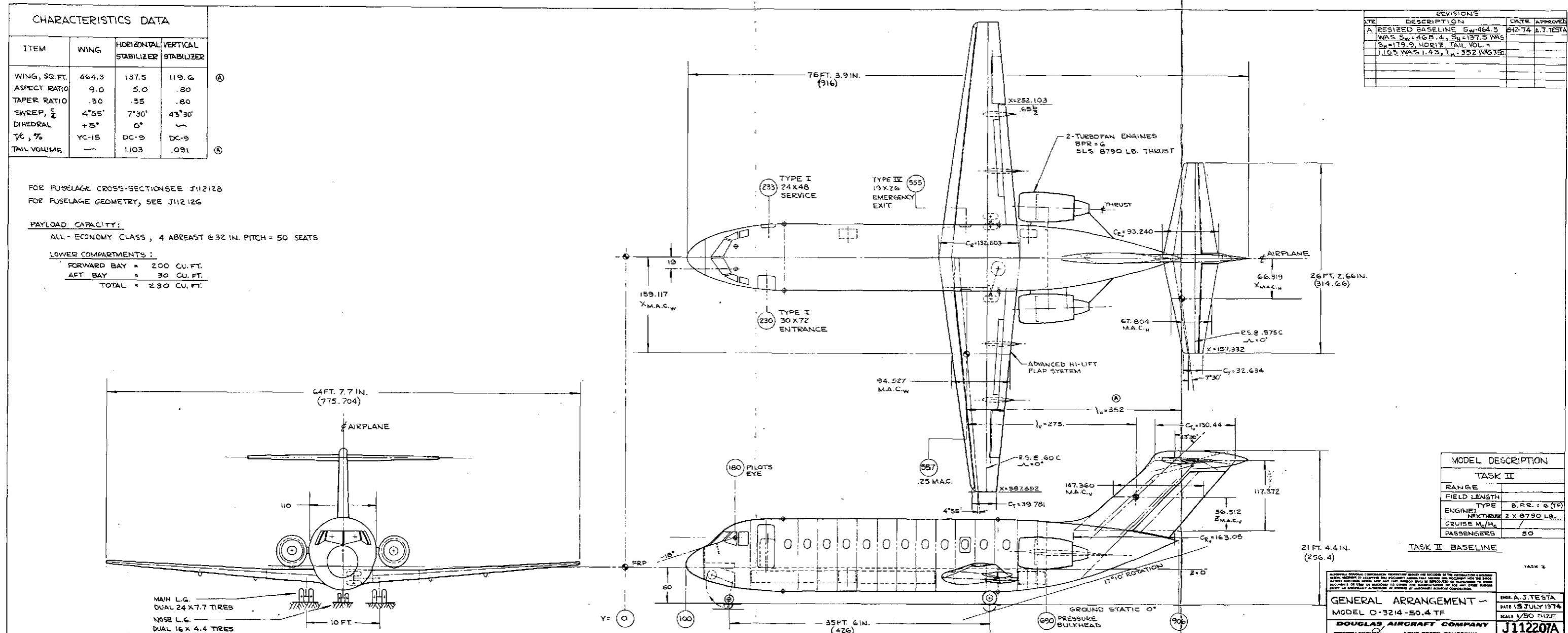


FIGURE A-35

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A-52

FOLDOUT FRAME 2

CHARACTERISTICS DATA			
ITEM	WING	HORIZONTAL STABILIZER	VERTICAL STABILIZER
AREA, SQ.FT.	49.6	154.9	143.2
SPECT RATIO	10.5	5.0	1.6
PER RATIO	0.30	0.35	0.35
WEEP	4° 35'	8° 00'	30°
MEDRAL	5°	5°	—
AIR VOLUME	—	1.27	0.12

FOR FUSELAGE CROSS-SECTION, SEE J11212B.
FOR INTERIOR ARRANGEMENT, SEE SHT. II.

PAYLOAD, CAPACITY:
ALL-ECONOMY CLASS, 4 ABREAST @ 32 IN. PITCH = 50 SEATS

LOWER COMPARTMENTS:

FORWARD BAY	=	150	CU. FT.
AFT BAY	=	100	CU. FT.
TOTAL	=	250	CU. FT.

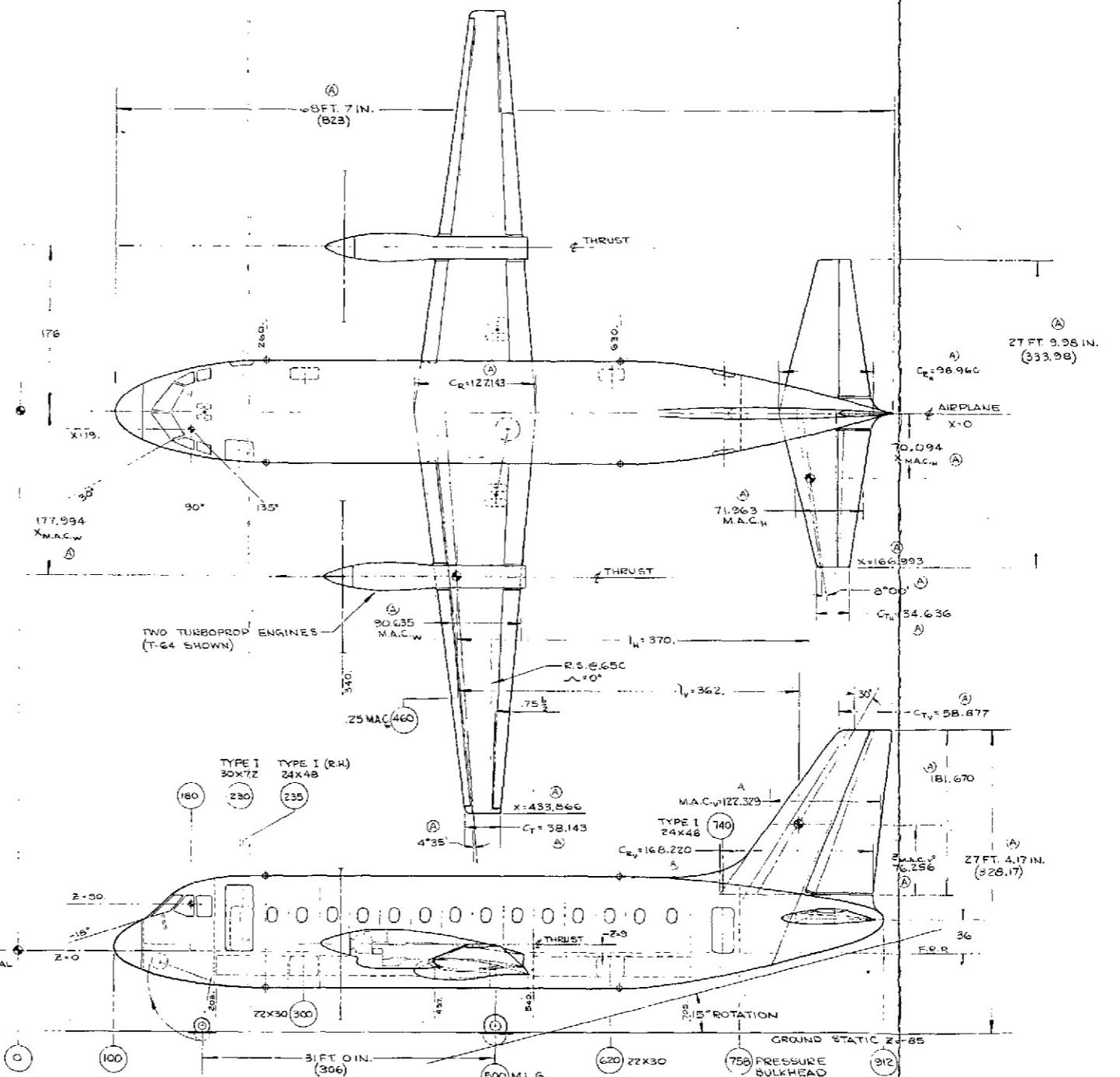
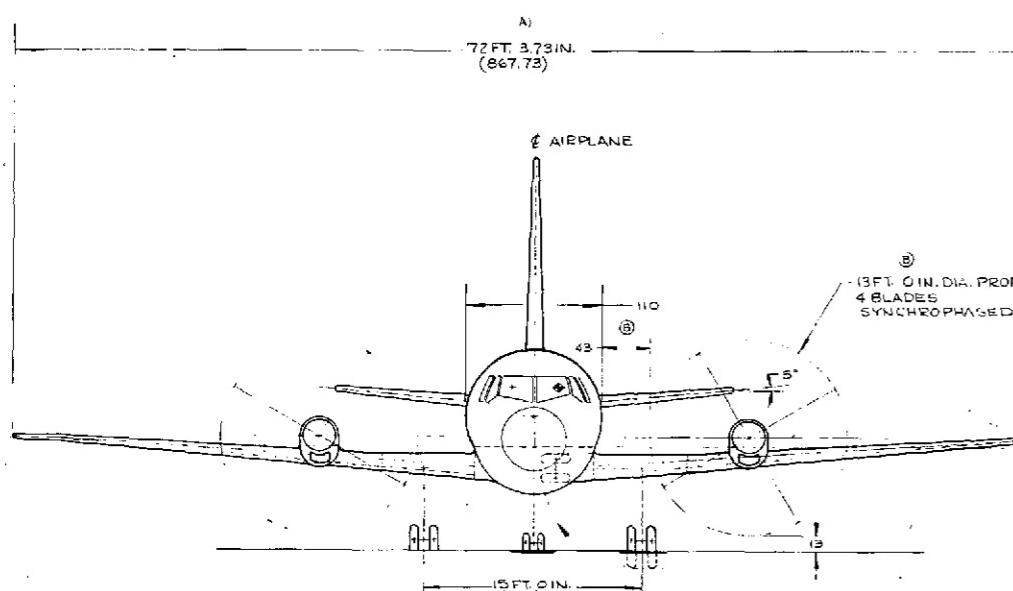


FIGURE A-36

A-53

FOLDOUT FRAME

GENERAL ARRANGEMENT
MODEL D-3215-50.2 TP
DOUGLAS AIRCRAFT COMPANY

TASK I
INQR A. J. TESTA
DATE 14 JUNE 74
SCALE 1/50 SIZE
J 112187B

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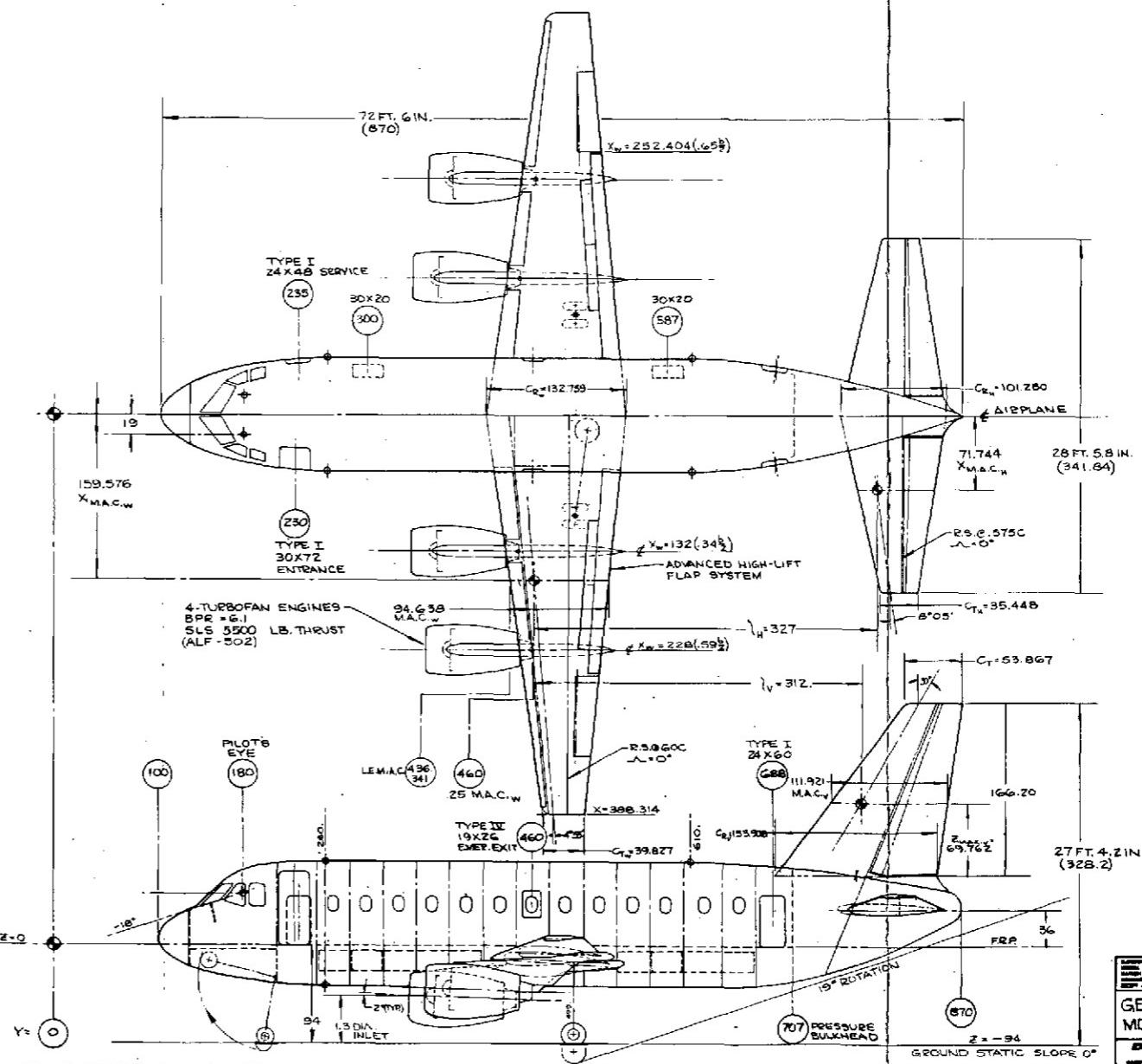
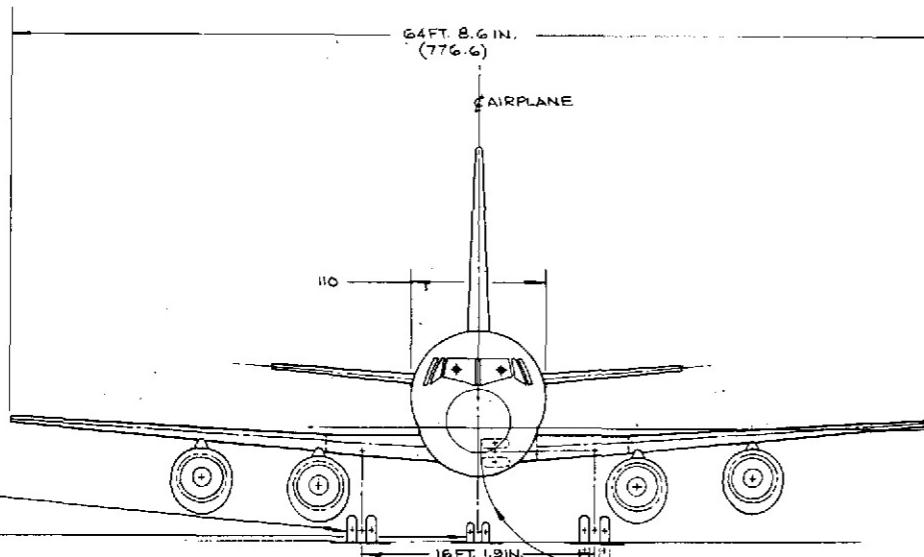
CHARACTERISTICS DATA			
ITEM	WING	HORIZONTAL STABILIZER	VERTICAL STABILIZER
WING, SQ.FT.	465.4	162.3	119.9
ASPECT RATIO	9.0	5.0	1.6
TAPER RATIO	.30	.35	.35
SWEEP, %	45°55'	6°05'	30°
DIHEDRAL	+5°	5°	—
TAIL VOLUME	~	1.205	.1035

FOR INTERIOR ARRANGEMENT, SEE J112209 SHT. II.
FOR FUSELAGE CROSS-SECTION, SEE J112128

PAYOUT CAPACITY:
ALL - ECONOMY CLASS, 4 ABREAST @ 32 IN. PITCH = 50 SEATS

LOWER COMPARTMENTS

FORWARD BAY	*	104 CU.FT.
AFT BAY	*	87 CU.FT.
TOTAL	*	191 CU.FT.



MODEL DESCRIPTION	
TASK II	
RANGE	850 NM
FIELD LENGTH	4500 FT.
TYPE	ALF-50Z
ENGINE:	NX THRUST
	4 X 5500 LB.
CRUISE M./H. ₂ O	/
PASSENGERS/B	50

GENERAL ARRANGEMENT - MODEL D-3214-50.6 TF		ENG. A.J. TESTA DATE 6-21-74 SCALE 1/50 SIZE
DOUGLAS AIRCRAFT COMPANY AIRCRAFT DIVISION, LONG BEACH, CALIFORNIA		J 112219

FIGURE A-37

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A-54

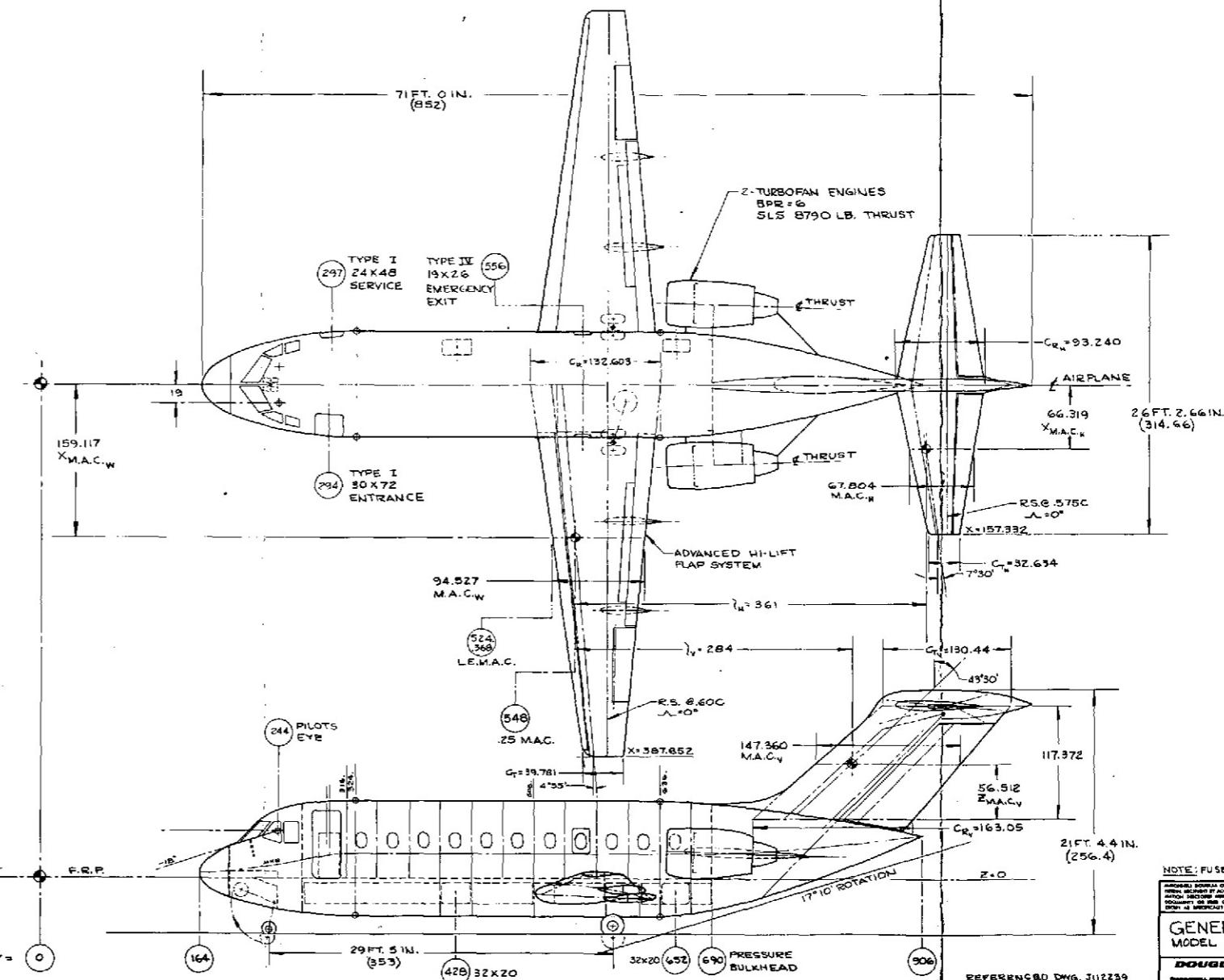
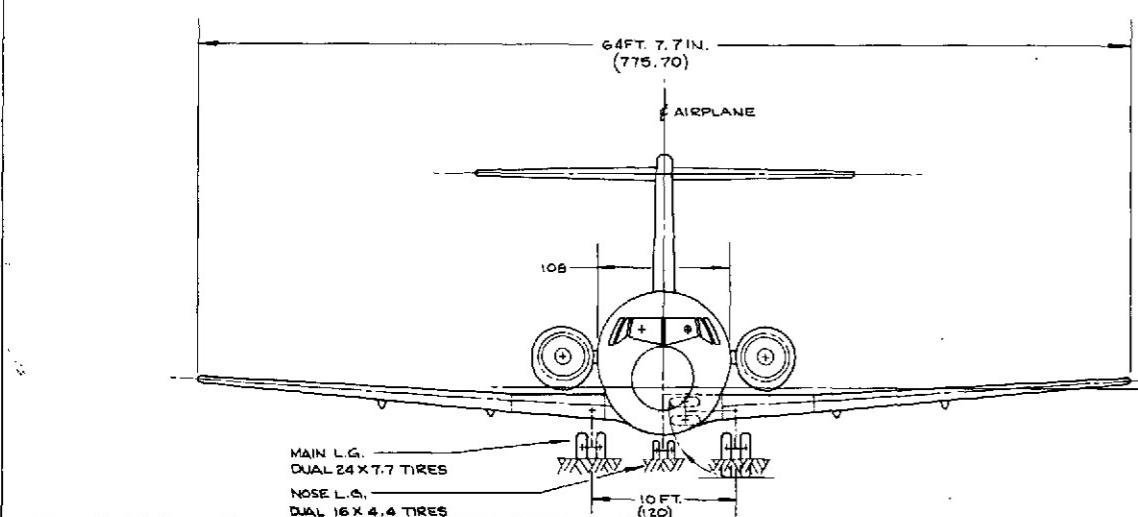
CHARACTERISTICS DATA			
ITEM	WING	HORIZONTAL STABILIZER	VERTICAL STABILIZER
WING, SQ.FT.	464.3	187.6	119.6
ASPECT RATIO	9.0	5.0	.80
TAPER RATIO	.30	.35	.80
SWEET, $\frac{S}{4}$	4°55'	7°30'	43°30'
DIHEDRAL	+5°	0°	~
T/C, %	YC-15	DC-9	DC-9
TAIL VOLUME	~	1.131	.094

FOR FUSELAGE CROSS-SECTION SEE JI12128
FOR FUSELAGE INTERIOR, SEE JI12248 SHT. II

PAYOUT LOAD CAPACITY: ALL - ECONOMY CLASS , 4 ABREAST @ 32 IN. PITCH = 42 SEATS

LOWER COMPARTMENTS:

FORWARD BAY = 156 CU.FT.
APT BAY = 47 CU.FT.
TOTAL = 203 CU.FT.



MODEL DESCRIPTION	
TASK II	
RANGE	
FIELD LENGTH	
ENGINE W/ XTRMST	TYPE B.P.R. = G (T.R.) Z X B790
CRUISE M./L.	/
PASSENGERS	42

NOTE: EUSTATIS IS A C4 Processor On Board A Memory.

FIGURE A-38

A-55

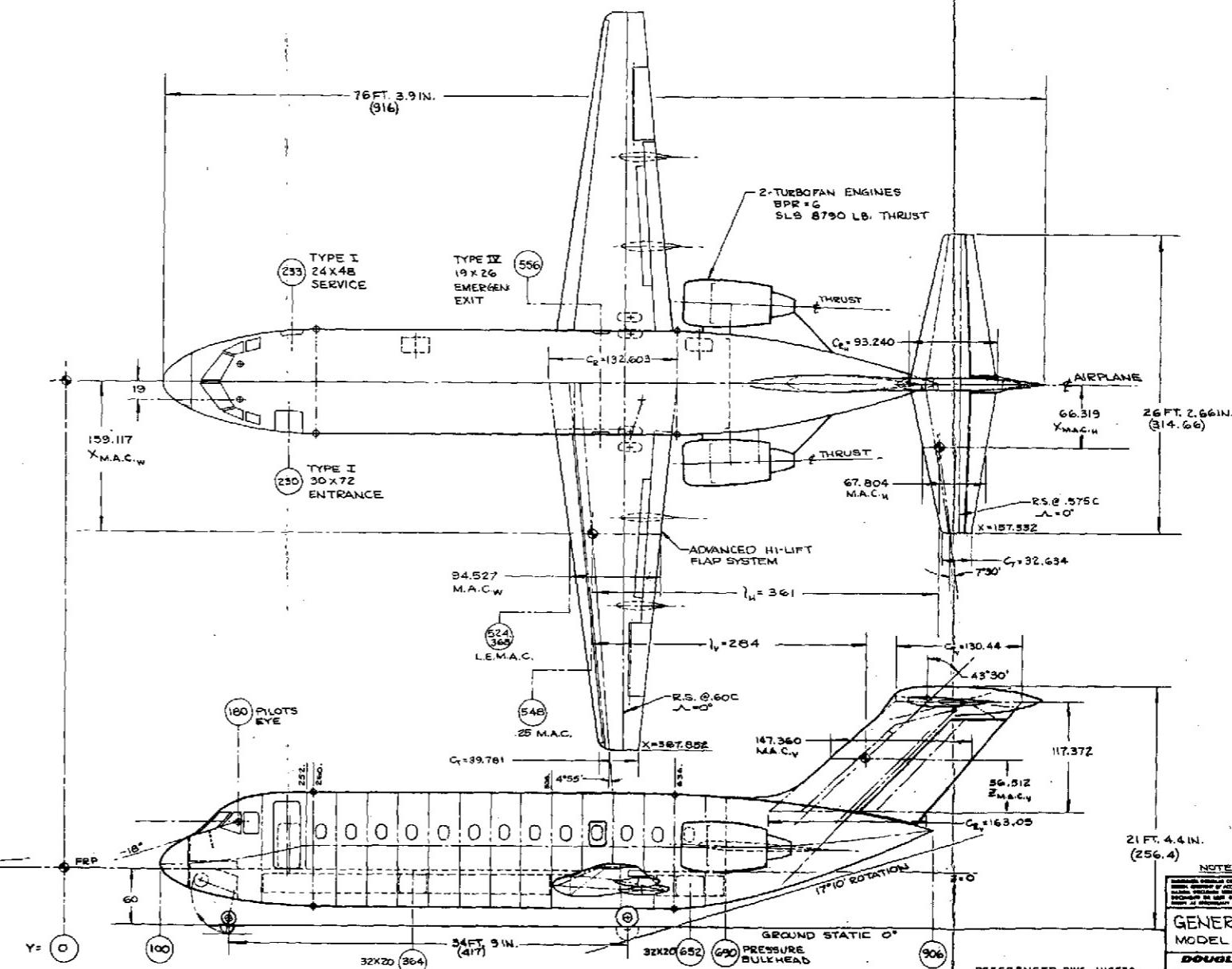
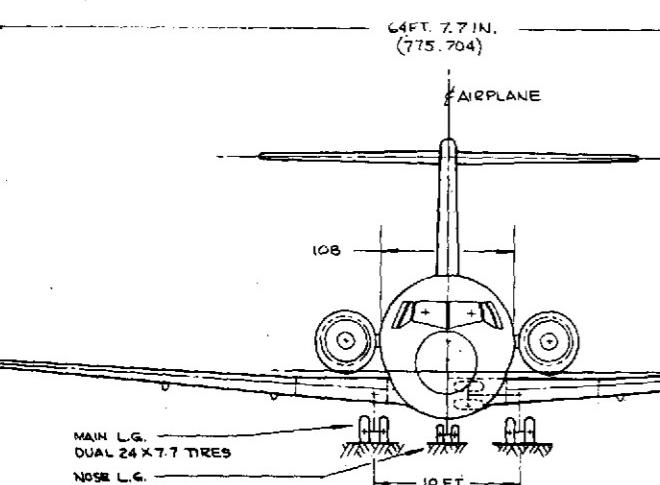
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CHARACTERISTICS DATA			
ITEM	WING	HORIZONTAL STABILIZER	VERTICAL STABILIZER
WING, SQ.FT.	464.3	137.5	119.6
ASPECT RATIO	9.0	.50	.80
TAPER RATIO	.30	.35	.80
SWEEP, $\frac{S}{4}$	4°55'	7°30'	43°30'
Dihedral	+5°	0°	—
TC, %	YC-15	DC-9	DC-9
TAIL VOLUME	—	1.131	.094

FOR FUSELAGE CROSS-SECTION SEE J112128
FOR FUSELAGE GEOMETRY AND INTERIOR SEE J112126

PAYOUT CAPACITY:
ALL - ECONOMY CLASS, 4 ABREAST @ 32 IN. PITCH = 50 SEATS

LOWER COMPARTMENTS:
FORWARD BAY = 200 CU.FT.
AFT BAY = 47 CU.FT.
TOTAL = 247 CU.FT.



MODEL DESCRIPTION	
TASK II	
RANGE	—
FIELD LENGTH	—
ENGINE TYPE	B.P.R. & G (TP)
NEUTRAL	2 X 8790 LB.
CRUISE M/H	—
PASSENGERS	50

NOTE: BASELINE AIRPLANE WITH RELOCATED WING

A. J. TESTA
MAR 10-23-74
KM 1/50 SIZE
DOUGLAS AIRCRAFT COMPANY
LAPAGO, CALIFORNIA

GENERAL ARRANGEMENT
MODEL D-3214-50-4A T.F.
REFERENCED DWG. J112129
J112249

FIGURE A-39

A-56

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CHARACTERISTICS DATA			
ITEM	WING	HORIZONTAL STABILIZER	VERTICAL STABILIZER
WING, SQ.FT.	464.3	137.5	119.6
ASPECT RATIO	9.0	5.0	.80
TAPER RATIO	.30	.35	.80
SWEEP, $\frac{c}{4}$	4°55'	7°50'	45°30'
DIHEDRAL	+5°	0°	~
TC, %	YC-15	DC-9	DC-9
TAIL VOLUME	~	1,392	.1156

FOR FUSELAGE CROSS-SECTION SEE J112126
FOR FUSELAGE GEOMETRY AND INTERIOR SEE J11

FOR FUSELAGE GEOMETRY AND INTERIOR SEE J112127

PAYOUT CAPACITY: ALL-ECONOMY CLASS, 4 ABREAST @ 32 IN. PITCH = 70 SEATS

LOWER COMPARTMENTS:

FORWARD BAY	=	264	CU.FT.
AFT BAY	=	91	CU.FT.
TOTAL	=	355	CU.FT.

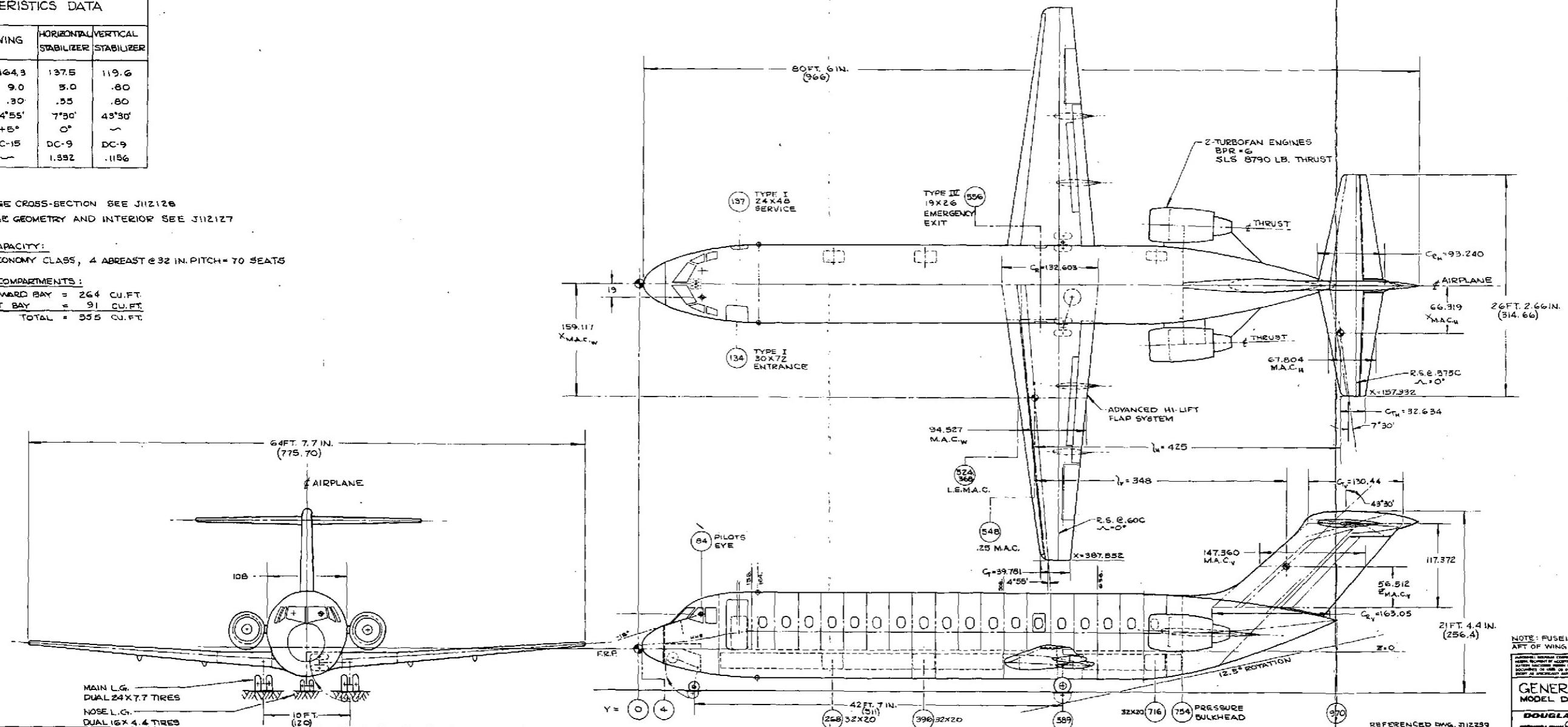


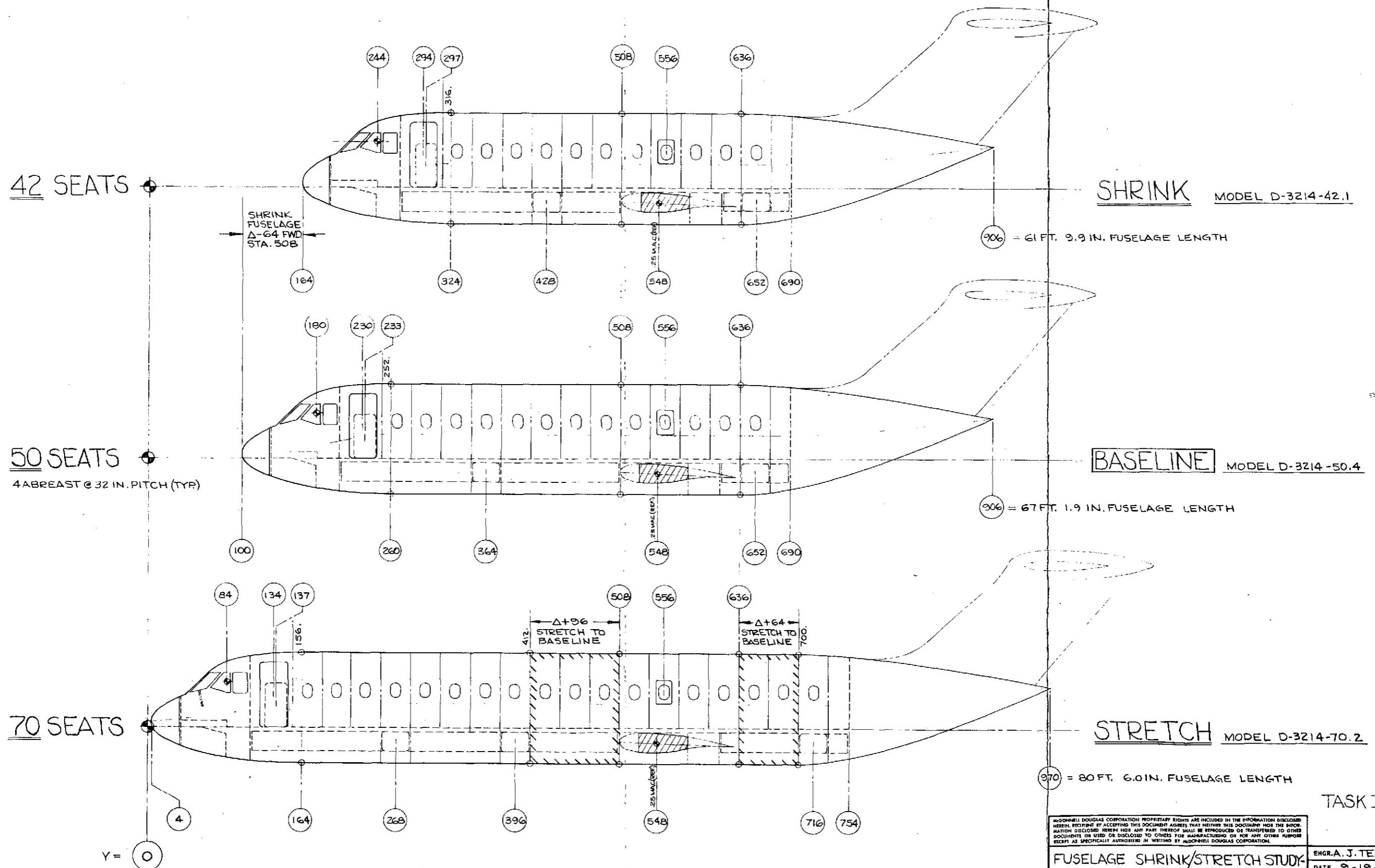
FIGURE A-40

A-57

MOLDON FRAME

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TASK II

FIGURE A-41

A-58

FIGURE A-41

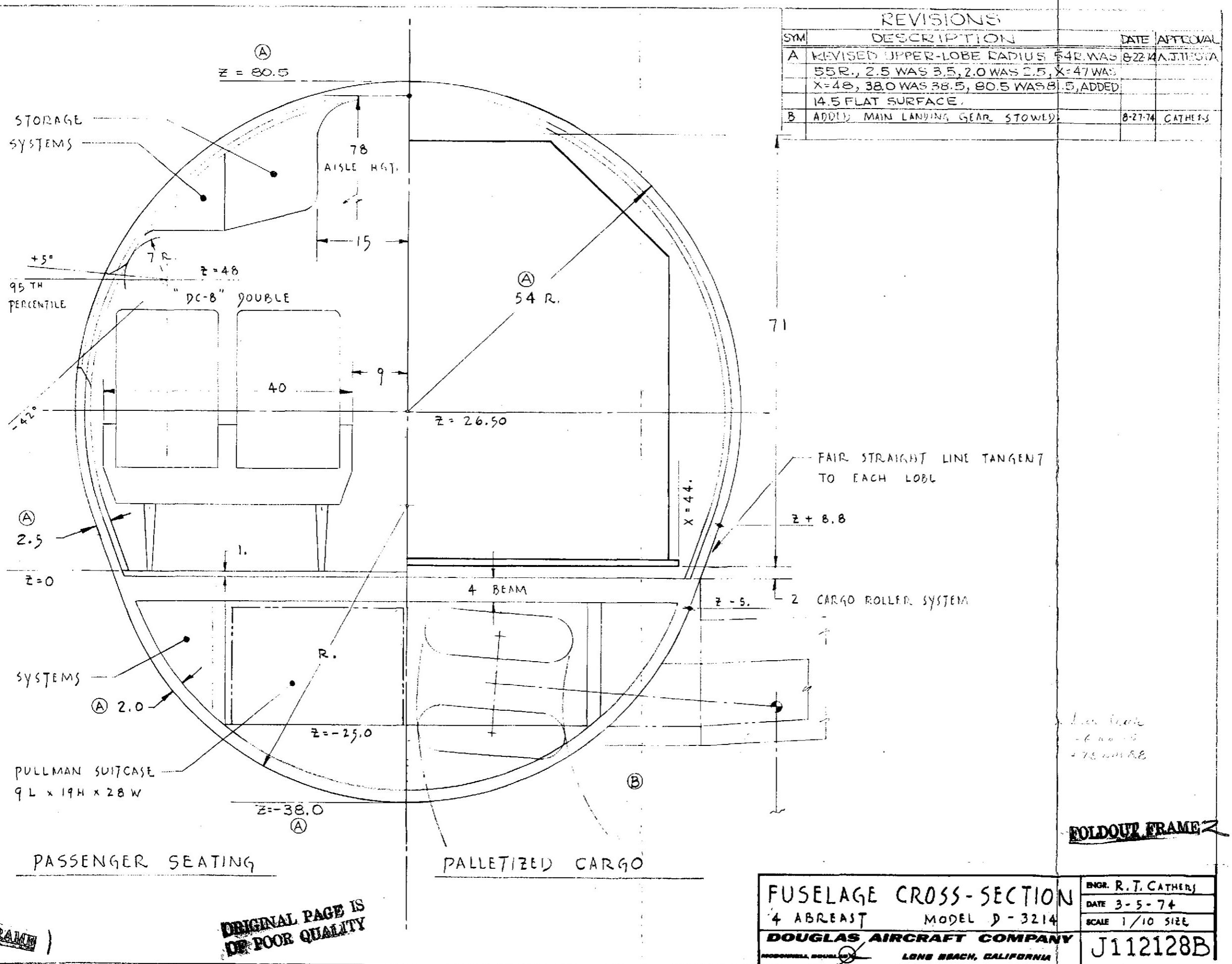
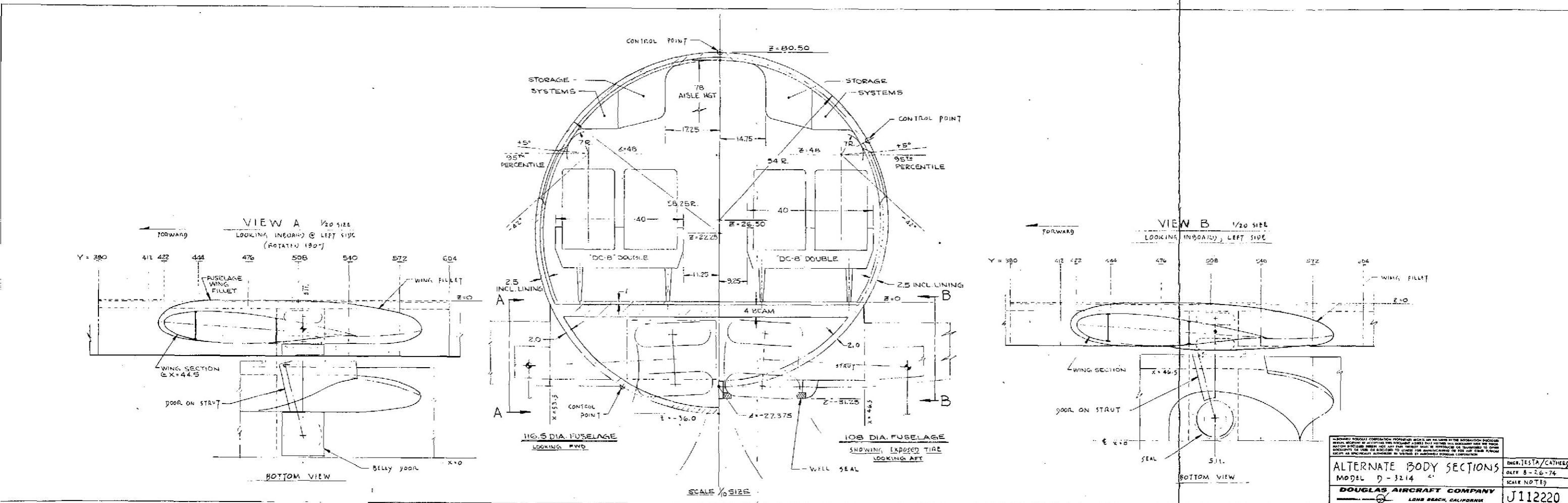


FIGURE A-42

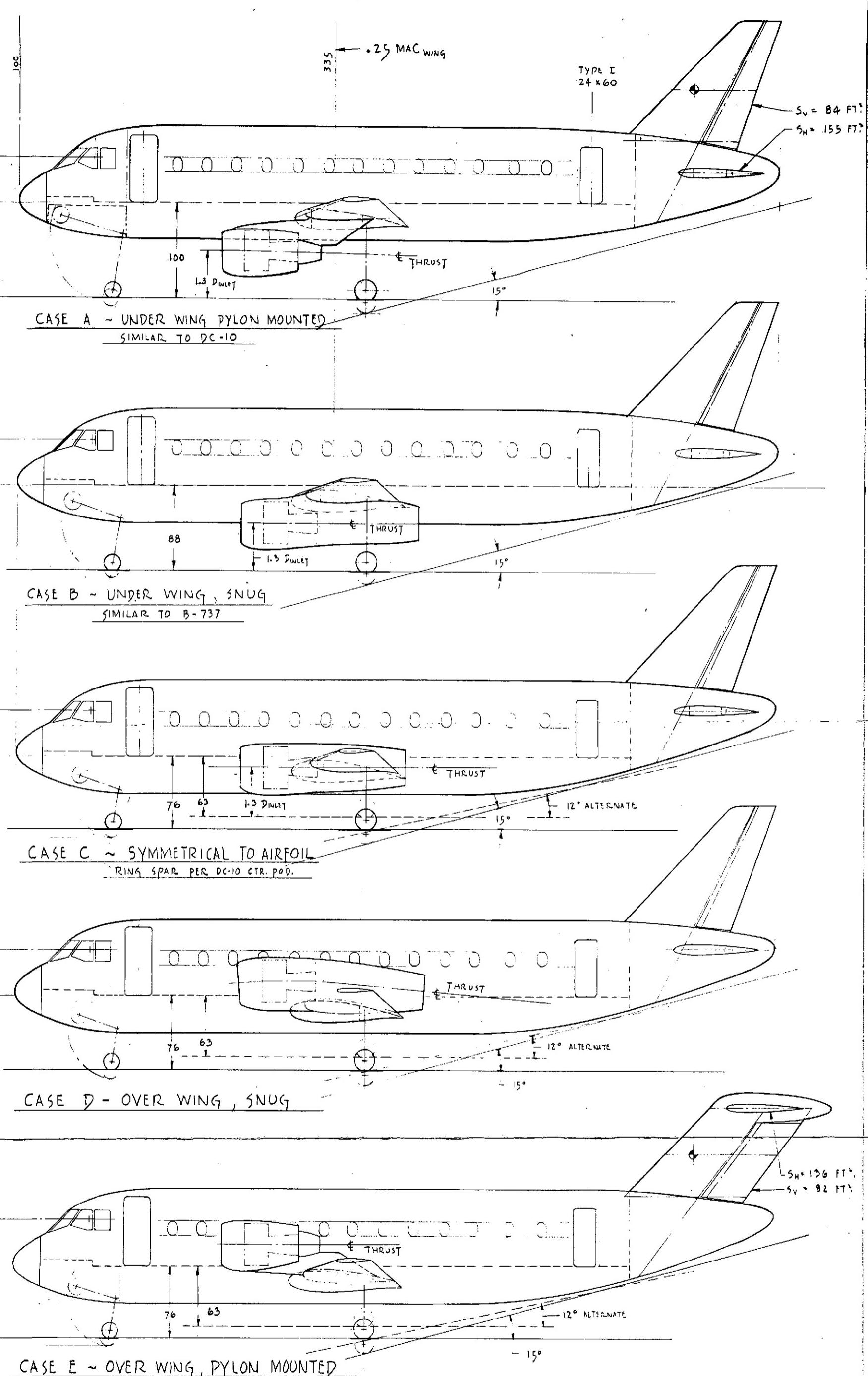


A-60

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C-2

FOLDOUP FRAME



A.5 PROPELLER DESIGN AND SELECTION

This section describes the Douglas procedure used in the design and selection of the propeller. Conventional propeller formulae (Section A.5.1) are not suitable for use in integrating engine-propeller and airframe characteristics, in order to study a propeller family designed for a given set of takeoff and cruise requirements, and finally select the best engine-propeller combination.

Accordingly, unconventional propeller formulae (Section A.5.2) were developed, along with engine-propeller characteristics relating takeoff and flight thrust (Section A.5.3). In turn, these formulae were combined with the airframe cruise condition characteristics, thus interrelating the engine-propeller and airframe takeoff and flight requirements (Section A.5.4).

Equations #2, 3 and 4 (Section A.5.2) define the engine-propeller family; equations #8, 9 and 10 (Section A.5.4) relate these characteristics to the takeoff thrust-and power-to-weight ratios for takeoff and cruise.

Tables A-10, A-11 and A-12 show the data for a typical solution. Table A-10 shows two cruise conditions for a turboprop aircraft, derived from a turbofan configuration, assuming no change in gross weight or drag. Table A-11 shows the equations necessary for an engine-propeller family study, satisfying the requirements for a 4500 foot field length and a cruise condition of 0.60 Mach at 20,000 foot altitude. Table A-12 tabulates the results.

A.5.1 Conventional Propeller Formulae

Power Coefficient: $C_P = \frac{(SHP) (\rho_{SL}/\rho)}{2000(N/1000)^3 (D/10)^5}$

Thrust Coefficient: $C_T = \frac{F (\rho_{SL}/\rho)}{6600(N/1000)^2 (D/10)^4}$

Advance Ratio: $J = 60 V_C/ND$

Efficiency: $\eta = J (C_T/C_P)$

Thrust: Takeoff, at $J \leq 0.8$, using design charts of (C_T/C_P) vs C_P

$$F = (C_T/C_P) \frac{33000(SHP)}{ND}$$

Thrust: Flight, at $J \geq 0.8$, using design charts of C_P vs. J with η as parameter

$$F = \eta (SHP)(550/V_C)$$

Where:

SHP = Shaft horsepower

ρ = Atmospheric density (slugs/ft³)

N = Revolutions per minute

D = Propeller diameter (ft)

F = Thrust (lb)

V_C = Velocity, cruise (fps)

SL = Subscript; sea level, standard day

A.5.2 Unconventional Propeller Formulae

In order to relate takeoff and flight performance, the formulae above are expressed in a different form, as follows:

$$\text{Propeller Disc Area: } S_{\pi} = (\pi/4) D^2$$

$$\text{Propeller Tip Speed: } V_T = (\pi/60) ND \\ \text{(static, fps)}$$

$$\text{Advance Ratio: } J = \pi (V_C/V_T) = \pi (C_S M_C / V_T) \quad (1)$$

$$\text{Disc Load,Thrust: } \frac{F}{S_{\pi}} = 1289.6 \rho (V_T/100)^2 (C_T/C_p) C_p, \text{ at } J \leq 0.8 \quad (2)$$

$$= 1289.6 \rho (V_T/100)^2 (\eta/J) C_p, \text{ at } J \geq 0.8$$

$$\text{Disc Load, Power: } \frac{SHP}{S_{\pi}} = 74.63 (V_T/100)^3 C_p \quad (3)$$

$$\text{Thrust/Power Ratio: } \frac{F}{SHP} = \frac{1727.9}{V_T} (C_T/C_p), \text{ at } J \leq 0.8 \quad (4)$$

$$= \frac{1727.9}{V_T} \frac{\eta}{J}, \text{ at } J \geq 0.8$$

Where: C_S = Speed of sound (fps)

M_C = Mach number

A.5.3 Takeoff and Flight Relationship: Engine-Propeller

The unconventional formulae above are used to relate propeller performance in flight with that at static takeoff condition:

$$\text{Atmospheric Density Ratio: } \sigma = \rho/\rho_R$$

$$\text{Horsepower Ratio: } K_p = (SHP)_C/(SHP)_{R0} = \sigma C_{p_C} / C_{p_{R0}} \quad (5)$$

$$\text{Thrust (Cruise/Takeoff): } \frac{F_C}{F_{R0}} = \frac{K_p (\eta_C/J_C)}{(C_T/C_p)_{R0}} \quad (6)$$

Where: R = Subscript: reference altitude for takeoff, usually sea level standard or 90°F day

0 = Subscript: Static condition

A.5.4 Takeoff and Flight Relationship: Engine-Propeller and Airframe

$$\text{Excess Cruise Thrust: } (nF_C - D_C)(V_C/W_C) = 5 \text{ fps}$$

Relating the standard requirement above with the airframe characteristics, we obtain:

$$\text{Cruise Thrust/Weight: } \frac{nF_C}{W_G} = \left[\frac{1}{(L/D)_C} + \frac{5}{C_S M_C} \right] \frac{W_C}{W_G} \quad (7)$$

Using formulae #1 through #7 above, we obtain:

$$\frac{nF_{RO}}{W_G} = \frac{(C_T/C_P)_{RO}}{K_p(\eta/J)_C} \left[\frac{1}{(L/D)_C} + \frac{5}{C_S M_C} \right] \frac{W_C}{W_G} \quad (8)$$

$$\frac{n(SHP)_{RO}}{W_G} = \frac{(V_T/1727.9)}{K_p(\eta/J)_C} \left[\frac{1}{(L/D)_C} + \frac{5}{C_S M_C} \right] \frac{W_C}{W_G} \quad (9)$$

$$\frac{nS_{\pi}}{W_G} = \frac{7.7545}{V_T^2 \rho_R C_{RO}} \cdot \frac{1}{K_p(\eta/J)_C} \left[\frac{1}{(L/D)_C} + \frac{5}{C_S M_C} \right] \frac{W_C}{W_G} \quad (10)$$

Where: n = Number of engine-propeller power plants

D_C = Cruise drag (lb)

W_C = Cruise weight (lb)

$(L/D)_C$ = Cruise lift/drag ratio

W_G = Gross or takeoff weight (lb)

A.5.5 Procedure for Propeller Selection

The procedure for solution is as follows:

1. Select several values of C_p^{RO} and determine the corresponding values of $(C_T/C_p)^{RO}$ from the propeller take-off charts.
2. Using several values of V_T , compute F_{RO}/S_π , SHP_{RO}/S_π and $(F/SHP)^{RO}$.
3. Compute K_p , i.e., unitize the performance of a selected turboshaft engine family.
4. Compute nF_C/W_G for one or more cruise conditions, using airplane drag values and the minimum (or other) power margin.
5. At the design cruise conditions, compute C_{pC} for each value of C_p^{RO} and also J_C for each value of V_T .
6. Using the propeller cruise charts determine η_C at the design cruise conditions, for each combination of C_{pC} and V_T .
7. Finally, compute nF_{RO}/W_G , $nSHP_{RO}/W_G$ and nS_π/W_G .

TABLE A-10

PROPELLER SELECTION

AIRPLANE	TURBOFAN	TURBOPROP
CRUISE: ALT.: M_C	(FT) 23,000 0.685	20,000 0.60 0.50
S_W	(SQ.FT) 497	500 500
W/S_W	(LB/SQ.FT) 88.3	87.8 87.8
$f = C_{D_0} S_W$	(SQ.FT) 13.19	13.19 13.19
C_{D_0}	0.0265	0.0264 0.0264
q_c	(LB/SQ.FT) 283	246 171
C_L	0.3025	0.3460 0.4985
ΔC_{D_i}	0.0041	0.0053 0.0111
$5/C_S M_C$		0.0080 0.0096
nF_C/W_G		0.0966 0.0822
V_C	(FPS)	622 518
V_T	(FPS)	700 700
J_c		2.79 2.33
K_p		0.652 0.614

TABLE A-11
PROPELLER DESIGN PARAMETERS

$$\frac{nF_{R0}}{W_G} = (C_T/C_P)_{R0} \times \frac{2.79 \times 0.0966}{0.652 \eta_C} = 0.4134 \quad \frac{(C_T/C_P)_{R0}}{\eta_C} = 0.3634 \text{ (required, 4500 ft.field)} \quad (8)$$

$$\frac{nSHP_{R0}}{W_G} = \frac{700}{1728} \times \frac{2.79 \times 0.0966}{0.652 \eta_C} = \frac{0.1675}{\eta_C} \quad (9)$$

A-69

$$\frac{nS_\pi}{W_G} = \frac{7.755}{(700)^2 C_{P0} \rho_R} \times \frac{2.79 \times 0.0966}{0.652 \eta_C} = \frac{0.00275}{\eta_C C_{P0}} \quad (10)$$

$$F_{R0} S_\pi = 150.2 C_{T_{R0}} \quad (2)$$

$$SHP_{R0}/S_\pi = 60.9 C_{P_{R0}} \quad (3)$$

$$(F/SHP)_{R0} = 2.47 (C_T/C_P)_{R0} \quad (4)$$

TABLE A-12
PROPELLER FAMILY CHARACTERISTICS

B x A.F.	3 x 80	4 x 80	4 x 100	4 x 140	4 x 180	4 x 220	
V _T	700	700	700	700	700	700	
C _{LI}	0.15	0.15	0.15	0.15	0.15	0.15	
(C _T /C _P) ₀	0.795	0.793	0.785	0.775	0.762	0.750	
C _{P0}	0.185	0.243	0.298	0.393	0.459	0.525	
C _{T0}	0.147	0.193	0.234	0.305	0.357	0.394	
η_C	0.904	0.901	0.893	0.880	0.865	0.853	
A ₀	nF _{R0} /W _G	0.3634	0.3634	0.3634	0.3634	0.3634	0.3645 (8)
	nSHP _{R0} /W _G	0.1854	0.1860	0.1878	0.1903	0.1937	0.1965 (9)
	nS _π /W _G	0.01647	0.01257	0.01037	0.00796	0.00678	0.00615 (10)
F _{R0} /S _π	22.1	28.9	35.1	45.6	53.5	59.1	(2)
SHP _{R0} /S _π	11.28	14.78	18.2	23.9	28.5	31.9	(3)
(F/SHP) _{R0}	1.958	1.952	1.933	1.907	1.877	1.850	(4)
nF _{R0}	2 x 7975	2 x 7975	2 x 7975	2 x 7975	2 x 7975	2 x 7975	
nSHP _{R0}	2 x 4075	2 x 4080	2 x 4125	2 x 4180	2 x 4250	2 x 4310	
nS _π	2 x 361.5	2 x 276	2 x 227	2 x 175	2 x 149	2 x 135	
D	21.45	18.75	17.00	14.94	13.78	13.10	
N	623	713	785	895	970	1020	

A.6 ACOUSTICS

Tables A-13 to A-22 inclusive illustrate, in a very abbreviated form, various computer print-outs of three computer programs: B5BA, Generalized Engine Cycle Procedure; SNAP, Douglas Source Noise Analysis Procedure; and ALFA, Aircraft Contour/Community Noise Impact Evaluation Program.

Table A-13 contains a sample computer print-out of the B5BA computer program used in the parametric aircraft studies. The data shown are for the 50 passenger, 4500 foot (1371.6 m) field length, 2 x 250 nautical mile (463 km) stage length, nominal flap, fixed-pitch turbofan aircraft.

Table A-14 contains a sample computer print-out of the Douglas SNAP computer program used for estimating the flyover noise levels of the final design basepoint aircraft. The data shown are for the approach case of the 50 passenger, 850 nautical mile (1574.2 km) range, advanced flap, fixed-pitch turbofan aircraft. The hardwall treatment lines indicate the noise levels without any acoustic treatment. The minimum treatment lines indicate the noise levels obtained employing the cowl wall acoustic treatment shown in Figure 8-5, Volume II. The maximum treatment lines indicate the noise levels obtained when the engine components are treated to the jet/core noise floor. The effect of non-propulsive noise is not included in estimated levels.

Tables A-15 through A-22 contain a sample computer print-out of the ALFA Computer program for the final design basepoint aircraft, and the typical operational takeoff and landing procedure. Chicago Midway Airport was used for the noise impact analysis.

TABLE A-13
MEDIUM DENSITY AIR TRANSPORTATION (TURBOFAN)
ACOUSTICS ANALYSIS

AIRCRAFT TAKEOFF GROSS WEIGHT = 43920	FIELD LENGTH = 4500
ENGINE BYPASS RATIO = 6.0	ENGINE SCALING FACTOR = 0.20
ENGINE TREATMENT CONFIGURATION = HARDWALL	NUMBER OF ENGINES = 2
NUMBER OF PASSENGERS = 50	WING AREA (SW) = 497
STAGE LENGTH = 250	DESIGN THRUST (FNDES) = 7980

A-72

	TAKEOFF	APPROACH	SIDELINE
FAR PART 36 REQUIREMENTS (-10 dB)	83.0	92.0	92.0
ALTITUDE (FEET)	2970	370	1672 (SLANT RANGE)
THRUST (PERCENT)	0.70	0.40	1.00
AIRPLANE VELOCITY (KNOTS TAS)	146.0	134.0	146.0
FAR PART 36 ESTIMATED EPNL	78.2	98.3	87.1

TABLE A-14
MEDIUM DENSITY TASK II BASEPOINT, MIXED FLOW, (W/APPROACH DCF)

DESIGN CASE 1. MEDIUM DENSITY BASEPOINT MOD D3214-50.4, APPROACH (2 ENG. 370 ALT. FN 2283 LBS)

ENGINE THRUST = 2283. ENGINE RPM = 5397.60

A-73

TREATMENT	DISTANCE	FAN INLET	FAN EXHAUST	TURBINE	JET	CORE	AFT PNL	INLET PNL	D.C.	EPNL	
A-73	Hardwall	200.	110.13	108.70	102.11	70.89	94.99	110.27	110.28	-8.00	102.28
	Minimum	200.	104.01	99.90	99.47	70.89	94.99	103.97	104.25	-8.00	96.25
	Maximum	200.	100.54	95.77	96.18	70.89	94.99	100.97	100.96	-8.00	92.97
	Hardwall	370.	103.34	101.91	94.91	64.86	88.96	103.45	103.50	-5.50	98.00
	Minimum	370.	97.22	93.11	92.27	64.86	88.96	97.15	97.49	-5.50	91.99
	Maximum	370.	93.75	88.98	88.98	64.86	88.96	94.26	94.24	-5.50	88.76
	Hardwall	1000.	89.28	87.84	79.84	54.18	78.29	89.44	89.48	-1.30	88.18
	Minimum	1000.	83.16	79.04	77.20	54.18	78.29	83.55	83.64	-1.30	82.34
	Maximum	1000.	79.68	74.91	73.90	54.18	78.29	81.30	80.63	-1.30	80.00
	Hardwall	4000.	63.27	61.84	48.16	37.38	61.49	65.15	64.18	3.20	68.35
	Minimum	4000.	57.15	53.04	45.52	37.38	61.49	62.34	59.88	3.20	65.54
	Maximum	4000.	53.68	48.91	42.23	37.38	61.49	61.87	58.34	3.20	65.07
	Hardwall	10000.	42.00	40.57	17.90	25.05	49.16	49.83	46.27	4.40	54.23
	Minimum	10000.	35.88	31.77	15.26	25.05	49.16	49.28	44.78	4.40	53.68
	Maximum	10000.	32.41	27.64	11.97	25.05	49.16	49.22	44.46	4.40	53.62

TABLE A-15
ENGINE NOISE DATA, EPNDB

		THRUST				
		2000.0	3000.0	4000.0	5000.0	6000.0
S	500.	88.0	91.5	94.2	96.5	98.5
L	1000.	80.5	84.5	88.0	90.5	92.2
A	2000.	71.5	76.5	80.5	83.0	85.5
N	3000.	65.7	71.2	75.3	78.2	80.6
T	4000.	61.3	67.3	71.5	74.5	77.0
R A N G E						
REF VEL		135.0	135.0	165.0	165.0	165.0

TABLE A- 16
TAKEOFF PARAMETERS

DISTANCE FBR ALONG FL PATH	DIST. FBR ALONG RUNWAY CENTERLINE	ALTITUDE	DISTANCE FROM RUNWAY CENTERLINE	AIRCRAFT VELOCITY	THRUST	FLAP ANGLE	EXHAUST VELOCITY	EXHAUST TEMP.
0.0	0.0	0.0	0.0	0.0	8039.0	0.0	0.0	0.0
2744.2	2744.2	0.0	0.0	127.0	6289.0	0.0	0.0	0.0
3435.2	3435.2	35.0	0.0	133.3	6218.5	0.0	0.0	0.0
6066.6	6066.6	362.9	0.0	142.3	6149.4	0.0	0.0	0.0
8361.8	8361.8	592.0	0.0	157.1	6007.0	0.0	0.0	0.0
10921.1	10921.1	950.8	0.0	161.9	5988.3	0.0	0.0	0.0
13879.9	13879.9	1485.3	0.0	162.0	6040.0	0.0	0.0	0.0
14202.1	14202.1	1542.1	0.0	161.5	4086.5	0.0	0.0	0.0
16626.9	16626.9	1796.1	0.0	160.5	4116.1	0.0	0.0	0.0
19054.7	19054.7	2015.2	0.0	160.5	4131.7	0.0	0.0	0.0
21535.8	21535.8	2236.8	0.0	160.5	4147.5	0.0	0.0	0.0
24773.8	24773.8	2522.2	0.0	160.5	4168.4	0.0	0.0	0.0

TABLE A-17
APPROACH PARAMETERS

DISTANCE TT ALONG FL PATH	DISTANCE TT ALONG RUNWAY CENTERLINE	ALTITUDE	DISTANCE FROM RUNWAY CENTERLINE	AIRCRAFT VELOCITY	THRUST	FLAP ANGLE	EXHAUST VELOCITY	EXHAUST TEMP.
0.0	0.0	50.0	0.0	123.5	1902.0	0.0	0.0	0.0
693.0	693.0	100.0	0.0	123.7	1907.0	0.0	0.0	0.0
2083.0	2083.0	200.0	0.0	123.9	1916.0	0.0	0.0	0.0
3475.0	3475.0	300.0	0.0	124.0	1925.0	0.0	0.0	0.0
4868.0	4868.0	400.0	0.0	124.2	1935.0	0.0	0.0	0.0
6263.0	6263.0	500.0	0.0	124.4	1944.0	0.0	0.0	0.0
7660.0	7660.0	600.0	0.0	124.6	1953.0	0.0	0.0	0.0
9060.0	9060.0	700.0	0.0	124.8	1963.0	0.0	0.0	0.0
10462.0	10462.0	800.0	0.0	125.0	1973.0	0.0	0.0	0.0
11866.0	11866.0	900.0	0.0	125.1	1982.0	0.0	0.0	0.0
13271.0	13271.0	1000.0	0.0	125.3	1992.0	0.0	0.0	0.0
16080.0	16080.0	1200.0	0.0	125.3	2011.0	0.0	0.0	0.0

TABLE A-18
EPNL GRID - TAKEOFF
(DISTANCE FROM FLIGHT PATH CENTERLINE, FT)

DISTANCE F.B.R. TYPE NOISE	0 5000	500 5500	1000 6000	1500 6500	2000 7000	2500 7600	3000 8000
0. Engine Noise	114.5	101.3	92.2	87.7	84.6	81.3	78.6
1000. Engine Noise	110.0	97.2	88.3	83.4	79.8		
4500. Engine Noise	103.8	97.0	88.9	83.7	80.0		
7000. Engine Noise	99.6	95.8	90.2	85.1	81.2	77.9	
9500 Engine Noise	95.6	93.4	89.6	85.2	81.2	77.8	
12500 Engine Noise	90.4	89.5	87.6	85.3	82.9	79.6	
14000 Engine Noise	88.6	88.0	86.5	84.5	82.3	80.3	77.5
17500 Engine Noise	81.7	81.2	80.0	78.3			
19500 Engine Noise	80.7	80.2	79.1				
21000							

TABLE A- 19
EPNL GRID - APPROACH
(DISTANCE FROM FLIGHT PATH CENTERLINE, FT)

DISTANCE T.T. TYPE NOISE	0 5000	500 5500	1000 6000	1500 6500
0. Engine Noise	94.8	83.9	73.7	
1000. Engine Noise	93.8	84.8	75.0	
2000. Engine Noise	92.7	85.3	75.7	
4500. Engine Noise	90.0	85.0	76.8	
7000. Engine Noise	87.1	83.4	77.9	
9500 Engine Noise	84.1	81.8	77.2	
12000 Engine Noise	81.8	80.1	76.3	
14500 Engine Noise	79.8	78.4		

TABLE A-20

80.0 EPNdB NOISE CONTOUR POINTS - TAKEOFF
 (ALL DISTANCE IN FEET)

DISTANCE FBR ALONG FL PATH	DISTANCE FROM FL PATH CENTERLINE	COORDINATE POINTS	COORDINATE POINTS
0.	2743.	{ 0., 2743.)	{ 0., -2743.)
1000.	1978.	{ 500., 2321.)	{ 500., -2321.)
3000.	1667.	{ 3000., 1667.)	{ 3000., -1667.)
5500.	2090.	{ 5500., 2090.)	{ 5500., -2090.)
8500.	2161.	{ 8500., 2161.)	{ 8500., -2161.)
12000.	2405.	{ 12000., 2405.)	{ 12000., -2405.)
16000.	1181.	{ 16000., 1181.)	{ 16000., -1181.)
20767.	0.	{ 20767., 0.)	{ 20767., 0.)

AREA WITHIN TAKEOFF CONTOUR = 2.61 SQUARE MILES
 6.76 SQUARE KILOMETERS

TABLE A-21

80.0 EPNDB NOISE CONTOUR POINTS - APPROACH

(ALL DISTANCE IN FEET)

DISTANCE TT ALONG FL PATH	DISTANCE FROM FL PATH CENTERLINE	COORDINATE POINTS	COORDINATE POINTS
0.	2743.	(0., 2743.)	(0., -2743.)
500.	2648.	(500., 2648.)	(500., -2648.)
1500.	1170.	(1500., 1170.)	(1500., -1170.)
3000.	799.	(3000., 799.)	(3000., -799.)
5000.	807.	(5000., 807.)	(5000., -807.)
7500.	795.	(7500., 795.)	(7500., -795.)
10000.	664.	(10000., 664.)	(10000., -664.)
12000.	514.	(12000., 514.)	(12000., -514.)
14221.	0.	(14221., 0.)	(14221., 0.)

AREA WITHIN APPROACH CONTOUR = 0.86 SQUARE MILES
 2.23 SQUARE KILOMETERS

TOTAL AREA WITHIN CONTOUR = 3.47 SQUARE MILES
 8.99 SQUARE KILOMETERS

TABLE A-22
COMMUNITY NOISE IMPACT

AIRPORT -- MDW-MIDWAY (CHICAGO)

RUNWAY -- 22L

RUNWAY COORDINATES -- (2050., 1800) FEET RELATIVE TO AIRPORT REFERENCE POINT

RUNWAY ANGLE -- 228.0 DEGREES MEASURED COUNTERCLOCKWISE FROM EAST-WEST LINE

COORDS REL TO AIRPORT REF PT.	COORDS REL TO RUNWAY BR PT.	POPULATION	EPNL	ANNOYANCE FACTOR	NOISE IMPACT
(-11500., -13500.)	(20437., 168.)	66.4	80.0	0.001	0.05
(-8000., -11000.)	(16237., 1096.)	0.0	80.2	0.004	0.0
(-8000., -6000.)	(12521., -2249.)	0.0	81.3	0.025	0.0
(-5000., -9500.)	(13115., 2322.)	0.0	81.0	0.020	0.0
(-5000., -3000.)	(8284., -2027.)	137.5	81.0	0.019	2.64
(-2000., -5500.)	(8135., 1875.)	0.0	82.2	0.043	0.0
(-2000., 0.)	(4048., -1805.)	0.0	80.9	0.018	0.0
(0., -3500.)	(5310., 2028.)	125.4	80.3	0.007	0.86
(0., 0.)	(2709., -319.)	0.0	99.0	0.380	0.0
(0., 3000.)	(480., -2326.)	117.3	80.1	0.001	0.15
(500., -2500.)	(4233., 1725.)	0.0	81.7	0.034	0.0
(500., 3000.)	(145., -1955.)	44.7	84.2	0.083	3.72
(2000., -500.)	(1743., 1502.)	0.0	81.6	0.032	0.0
(2000., 2500.)	(-487., -506.)	0.0	84.4	0.087	0.0
(5000., 4000.)	(-3609., 720.)	83.0	81.5	0.031	2.56
(5000., 6000.)	(-5095., -618.)	127.1	82.9	0.058	7.33
(8000., 7500.)	(-6217., 608.)	127.1	81.5	0.031	3.92
(8000., 9000.)	(-9332., -396.)	22.0	82.4	0.047	1.04
(11000., 12000.)	(-13569., -174.)	63.4	80.0	0.000	0.02

TOTAL POPULATION AFFECTED = 11613.1

TOTAL NOISE IMPACT = 1485.16

APPENDIX B - OPERATIONS

B.1 CITY PAIRS TRAFFIC DENSITY

Table B-1 contains the CAB data on origin and destination air travelers for 1972. The data is organized by range increments of 100 miles and traffic density per year. The density classes are equivalent to 20 to 49 travelers per day per route for the first class only. The remaining class increments are 50 passengers per day per route to a maximum limit of 500 per day. City pairs are coded with a three-letter designation. This data provided the background for the preliminary size screening in Section 12.1.

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 0~ 99 TRAFFIC DENSITY: 7300~ 18249

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT PER PASSENGER
AHN	ATL	67	16,550	1,108,850
ATL	CSG	83	14,630	1,214,290
ATL	GAD	98	14,560	1,426,880
AVL	CLT	92	7,830	720,360
BAL	SBY	85	12,260	1,042,100
BDL	BOS	91	10,390	945,490
BDL	PVO	66	7,970	526,020
BFI	IAH	78	17,730	1,382,940
BUF	RDC	55	11,890	653,950
CHI	JVL	83	10,910	905,530
CLE	MFD	59	12,210	720,390
CVG	DAY	63	9,990	629,370
CYS	DEN	95	17,450	1,675,200
DAL	TYR	78	15,830	1,234,740
DUJ	PIT	84	9,710	815,640
HNL	LNY	73	14,870	1,085,510
JST	PIT	75	11,700	877,500
LAW	OKC	72	10,180	743,140
LAX	PMD	48	9,180	440,640
LAX	WJF	48	9,180	440,640
LEX	SDF	62	11,640	733,320
LNK	OMA	55	10,860	597,300
MOT	WAS	93	10,510	977,430
MEM	MKL	71	7,380	523,980
MEM	TUP	88	11,620	1,022,560
MGW	PIT	61	13,240	807,640
MKE	MKG	85	14,220	1,222,920
MKE	MSN	74	11,150	825,100
MKE	USH	87	7,890	686,430
MKK	OGG	46	9,380	440,860
MSP	RST	76	13,310	1,011,560
NYC	PHL	84	8,280	695,520
OWB	SDF	83	11,290	948,360
PHL	TTN	31	12,180	377,580
PIT	YNG	57	13,670	779,190
STL	UIN	94	12,140	1,141,160
TOTALS		36	423,780	31,380,090

TABLE B.1

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 0- 99 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT
			AS PASSENGER
ACT DAL	88	32,190	2,961,480
AIY PHL	47	27,750	1,304,250
BAL WAS	36	19,320	714,840
BTR MSY	65	22,200	1,443,000
CAK PIT	70	22,600	1,582,000
CKB PIT	83	20,660	1,714,780
COU STL	99	23,140	2,290,860
CVG SDF	83	28,150	2,336,450
DTT FNT	53	29,670	1,572,510
LAX PSP	97	25,530	2,476,410
MKC TOP	56	18,570	1,039,920
MRY SFO	86	32,480	2,825,760
TOTALS	12	302,260	22,262,260

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B-3

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 0- 99 TRAFFIC DENSITY: 36500- 54749

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT PASSENGER
ANB	ATL	82	45,620	3,740,840
BET	CHI	71	46,630	3,310,730
CHI	SBN	76	47,600	3,617,600
CHO	WAS	84	37,970	3,189,480
GPT	MIS	76	52,870	4,018,120
HNL	MKK	54	46,710	2,522,340
SFO	SMF	78	47,110	3,674,580
SPI	STL	84	39,260	3,297,840
TOTALS		8	363,770	27,371,530

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 0- 99 TRAFFIC DENSITY: 54750- 72999

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT RS PASSENGER
COS DEN	67	58,530	3,921,510
DTT LAN	79	57,490	4,541,710
DTT MBS	96	64,440	6,186,240
KOA OGG	90	65,100	5,859,000
TOTALS	4	245,560	20,508,460

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B-5

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 0- 99 TRAFFIC DENSITY: 91250- 109499

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
CLE DTT	94	108,820	10,229,080
HIC WAS	96	93,690	8,994,240
TOTALS	2	202,510	19,223,320

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 7300- 18249

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CITY-PAIRS		DISTANCE UNITS		TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGER	RS PASSENGER
ABQ	FMN	148	11,560	1,710,880
ABQ	HOU	163	13,970	2,277,110
ALB	BTV	124	8,520	1,056,480
ALB	ISP	139	15,740	2,203,600
ALB	SYR	119	17,250	2,052,750
ALO	MSP	166	10,970	1,821,020
ALS	DEN	169	9,400	1,588,600
AOU	PIT	102	10,970	1,116,940
APN	DTT	192	11,530	2,213,760
ATL	BHM	134	10,750	1,440,500
ATL	CAE	192	16,940	3,252,480
ATL	MGR	180	11,890	2,140,200
ATY	MSP	193	8,400	1,621,200
BDR	BOS	137	12,340	1,690,580
BFD	PIT	123	11,910	1,464,930
BFF	DEN	159	14,460	2,313,600
BFI	PDX	132	16,420	2,167,440
BJI	MSP	199	17,000	3,383,000
BMG	CHI	198	9,600	1,900,800
BWI	LWS	198	14,470	2,865,060
BDI	PIH	189	7,450	1,408,050
BRD	MSP	113	14,930	1,687,090
BRL	STL	146	11,040	1,611,840
BTR	MLU	146	9,310	1,359,260
BUF	CLE	186	12,400	2,306,400
CGI	STL	113	14,390	1,640,460
CHI	CWI	132	9,430	1,244,760
CHI	DNV	116	14,210	1,648,360
CHI	GBG	153	11,440	1,750,320
CHI	HUF	168	16,760	2,832,440
CHI	JXN	172	10,270	1,766,440
CHI	LAF	110	13,290	1,461,900
CHI	LAN	174	14,470	2,517,780
CHI	MIE	168	11,860	1,992,480
CHI	MTW	177	11,970	2,118,690
CIC	SFO	143	10,190	1,457,170
CKB	WAS	163	15,000	2,445,000
CLT	ILM	185	7,970	1,474,450
CLT	ROU	130	16,900	2,197,000
CMH	IND	182	11,720	2,133,040
COU	MKC	129	12,070	1,605,310
CRP	SAT	134	7,980	1,077,300

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4, Y6872, SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
CRW	MGW	125	8,730	
CRW	PIT	163	8,410	1,099,980
CWA	MSP	182	13,910	1,370,830
DAL	GGG	115	14,550	2,531,620
DAN	WAS	197	7,390	1,673,250
DEC	STL	109	7,700	1,455,830
DEN	GUC	140	10,140	839,300
DEN	LAR	114	8,910	1,419,600
DEN	MTJ	184	9,350	1,024,650
DSM	MKC	174	10,870	1,720,400
DTT	MKG	166	15,460	1,891,380
DTT	VNG	149	9,540	2,566,360
ELM	PHL	182	8,500	1,421,460
ESF	MSV	155	14,890	1,547,000
EUG	PDX	106	9,430	2,307,950
FLG	PHX	119	13,640	999,580
FSU	MSP	197	13,370	1,623,160
FSD	OMA	162	7,760	2,633,890
GCN	LAS	169	8,820	1,264,880
GRB	MKE	107	12,960	1,490,580
GRI	OMA	128	9,490	1,386,720
GRR	MKE	120	17,130	1,214,720
GTR	MEM	137	15,990	2,055,600
HPN	SYR	187	9,460	2,190,630
HVN	PHL	151	9,580	1,769,020
JAH	LCH	128	10,220	1,446,580
JAH	POE	152	8,390	1,287,720
JAH	SAT	191	11,180	1,275,280
JAH	VCT	117	7,310	2,146,560
IND	SDF	111	11,100	862,580
IPL	LAX	169	14,880	1,232,100
IPT	NYC	158	11,550	2,514,720
IPT	PHL	133	10,580	1,826,480
JAN	MEM	189	16,130	1,407,140
JRW	PIT	125	7,700	3,048,570
LAN	MKE	168	11,130	962,500
LAS	PSP	173	8,440	1,869,840
LUT	SAT	148	11,610	1,460,120
LSE	MSP	120	13,210	1,718,280
MEM	MSL	136	7,850	1,585,200
MGW	WAS	152	10,520	1,067,600
MKG	SLN	166	11,180	1,599,040
				1,855,880

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS MILES	TRAFFIC-DISTANCE PRODUCT	
			RS	PASSENGER
MSV POE	189	13,180		2,504,200
URF RDU	159	7,690		1,230,400
OTH PDX	170	8,550		1,462,050
PDX SEA	132	16,420		2,167,440
PHX YUM	160	13,300		2,128,000
PIT PSB	120	8,740		1,048,800
SBY WAS	101	12,940		1,319,880
SLC TWF	175	17,870		3,127,250
TRI TYS	100	9,410		941,000
TTN WAS	161	9,090		1,463,490
TOTALS	94	1,095,300		166,075,560

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGER AS	PASSENGER
ALB	ROC	198	27,730	5,490,540
ATL	GSP	154	27,660	4,259,640
ATL	MSL	197	24,150	4,781,700
ATL	TCL	186	29,780	5,539,080
AVP	NYC	100	30,540	3,094,000
BOL	SYR	192	25,530	4,901,760
BFT	PSC	173	24,600	4,255,800
BFT	YKM	105	18,790	1,972,450
BMI	CHI	114	18,970	2,162,580
BNA	TYV	152	28,200	4,286,400
BUS	HPN	165	26,500	4,399,000
BRL	CHI	190	29,480	5,601,200
BUF	SYR	134	26,540	3,556,360
CAR	DTT	132	19,820	2,616,240
CHI	DBQ	155	33,250	5,153,750
CHI	MKG	119	25,620	3,048,780
CLE	MLJ	145	30,590	4,466,140
CLE	CMH	117	26,510	3,101,670
CLE	DAY	167	32,230	5,414,640
CLE	PIT	104	26,180	2,748,900
CMH	DTT	161	24,600	3,960,600
CMJ	STL	143	19,000	2,717,000
CRF	IAH	193	28,680	5,563,920
CRW	CYG	173	29,290	5,067,170
CVG	HTS	123	36,380	4,474,740
DRL	OKC	181	19,730	3,613,050
DAL	TPL	120	25,670	3,208,750
DAL	TXK	157	33,270	5,223,390
DAY	DTT	172	21,450	3,753,750
DEN	PUB	104	26,730	2,779,920
DTT	PIT	198	21,090	4,175,820
DTT	SBN	167	20,120	3,360,040
EVV	IND	134	26,870	3,627,450
GLH	MEM	123	20,300	2,496,900
HTE	MSP	174	22,500	3,915,000
HOT	MEM	182	24,630	4,482,660
HSV	MEM	164	27,190	5,030,150
HIS	PIT	192	27,990	5,374,080
IPI	PIT	181	22,590	4,088,790
JLN	MKC	136	20,570	2,797,520
LAX	SMX	145	22,740	3,320,040
LIT	MEM	130	30,270	3,935,100

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
MHK	MKC	112	35,360	3,960,320
MKC	UNA	165	34,390	5,674,350
MKC	SGF	145	31,370	4,580,020
MLI	STL	186	29,630	5,629,700
MOB	MSY	130	31,230	4,059,900
MWA	STL	100	20,290	2,049,290
PAH	SDF	183	19,680	3,601,440
PAH	STL	145	21,950	3,182,750
PDX	PSC	174	26,560	4,621,440
PDX	YKM	120	22,360	2,683,200
PII	PAB	102	28,470	2,903,940
PSC	SEA	173	24,600	4,255,800
PUK	SDF	183	19,680	3,601,440
FOX	STL	145	21,950	3,182,750
RDD	SFO	189	24,990	4,723,110
RIC	ROA	146	20,310	2,965,260
SEA	YKM	105	18,790	1,972,950
SHD	WAS	100	26,150	2,615,000
STL	TBN	119	22,050	2,623,950
TOTALS		61	1,563,940	236,663,580

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4, Y6872, SYNC PERIOD: 1972

MEDIUM DENSITY
 AIR TRANSPORTATION
 STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 36500- 54749

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS MILES	TRAFFIC-DISTANCE PRODUCT	
			PASSENGERS	PASSENGER
ALB BOS	145	38,560	5,591,200	
AIS TAH	147	37,350	5,490,450	
AZO DTT	122	51,090	6,232,980	
BLF PIT	186	36,970	6,876,420	
CHI DEC	152	46,430	7,103,790	
DAL LAW	149	50,170	7,926,860	
EIM NYC	180	49,810	9,015,610	
ENI PIT	109	47,860	5,216,740	
ITH NYC	176	47,760	8,453,520	
IIO OGG	121	50,250	6,080,250	
LAS UNT	194	38,570	7,482,580	
LCH MSV	178	39,460	7,023,880	
LNK MKC	165	38,440	6,342,600	
CYH WAS	152	39,200	5,958,400	
MCO MIA	196	42,800	8,388,800	
JRF WAS	149	37,140	5,533,860	
PHX TUS	109	39,330	4,286,970	
PIA STL	137	42,710	5,851,270	
SGF STL	195	53,680	10,467,600	
TOTALS	19	827,580	129,323,780	

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 54750-72499

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
ABI	DAL	168	56,920	10,359,440
ATL	DRN	171	72,310	12,365,010
BOL	NYC	106	66,800	7,147,600
BGM	NYC	145	66,760	9,680,200
BOS	ISP	153	56,230	8,659,420
CMH	PIT	143	57,360	8,259,840
DTT	GRR	126	67,370	8,488,620
RNL	MUE	171	56,730	9,700,830
LFT	MSY	105	65,280	6,854,400
MDT	NYC	154	62,550	9,632,700
NYC	UCA	181	67,280	12,177,680
TOTALS		11	695,590	103,325,740

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100- 199 TRAFFIC DENSITY: 73000- 91249

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGERS	PASSENGER
ABY ATL	145	86,810	12,674,260
ATL AVL	164	90,940	14,914,160
BOL PHL	190	73,950	14,050,500
CHI GRR	134	88,520	11,861,680
CHI OSH	160	77,830	12,452,800
DAL SPS	124	74,950	10,118,250
DLH MSP	144	82,190	11,835,360
HUA WAS	184	88,440	16,272,960
TOTALS	8	663,630	104,179,970

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 91250-109499

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT HS PASSENGER
AZD CHI	116	107,550	12,475,800
CHI CMX	130	100,490	13,063,700
CHI IND	167	93,040	15,537,680
CHI SPI	172	107,710	18,526,120
NYC PVD	149	100,560	15,084,000
TOTALS	5	509,350	74,687,300

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 109500-127749

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT PASSENGER
ATL	HSV	151	124,850	18,852,350
AUS	DAL	182	124,550	23,290,850
CHI	GRB	181	110,600	20,018,600
MDT	PIT	182	121,110	22,042,020
NYC	SYR	197	127,080	25,034,760
TOTALS		5	608,190	109,238,580

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100-199 TRAFFIC DENSITY: 146000-164249

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGERS	PASSENGER
BAL NYC	179	153,030	27,392,970
LHI PIA	131	156,780	20,538,180
TOTALS	2	309,810	47,930,550

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 100- 199 TRAFFIC DENSITY: 164250- 182499

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
CHI MSN	118	171,640	20,253,520
PHL WAS	133	177,510	23,608,630
TOTALS	2	349,150	43,862,350

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200-299 TRAFFIC DENSITY: 7300-18249

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGER	PASSENGER
ABR	MSP	257	17,780	4,569,460
ALB	BAL	288	17,330	5,005,440
ALO	MKC	263	9,580	2,519,540
ART	NYC	248	9,730	2,413,040
ATL	HRV	225	16,850	3,791,250
ATL	INT	294	18,120	5,327,280
AVP	BOS	253	16,170	4,107,180
BUR	WAS	269	9,360	2,517,840
BFD	NYC	253	11,730	2,967,690
BFI	EUG	237	8,550	2,026,350
BFI	LWS	262	10,470	2,743,140
BGM	BOS	255	15,470	3,944,850
BGM	PIT	251	8,570	2,151,070
BLF	CVG	224	8,700	1,948,800
BLF	WAS	242	10,600	2,565,200
BNA	TRI	239	17,670	4,240,800
BOI	GEG	287	10,230	2,936,010
BOI	IDA	209	9,430	1,970,870
BOI	SLC	290	15,660	4,557,060
BPI	MSY	226	17,630	3,984,380
BUF	CMH	296	11,420	3,380,320
BUF	HPN	289	10,530	3,043,170
BDF	PHL	282	9,550	2,693,100
CAK	IND	268	14,160	3,794,080
CHA	MEM	270	16,770	4,544,670
CHI	DTT	238	15,650	3,724,700
CHI	ESC	267	12,830	3,425,610
CHI	IMT	272	10,740	2,921,280
CHI	MNM	224	9,090	2,036,160
CID	STL	228	12,690	2,893,320
CLE	CVG	226	17,570	3,970,820
CLE	ELM	296	15,270	3,909,120
CLE	GRR	216	7,740	1,671,840
CLE	MDT	274	11,050	3,027,700
CLT	DRF	289	18,010	5,204,890
CLT	RIC	256	15,570	3,985,920
CRW	WAS	238	10,840	2,579,920
CVG	PIT	256	13,330	3,412,480
DAL	HOT	232	16,870	3,913,840
DAL	LCH	273	11,530	3,147,690
DAL	PUE	236	11,800	2,784,800
DAY	MKE	285	16,080	4,582,800

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200-299 TRAFFIC DENSITY: 7300-18249

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGER	RS PASSENGER
DEN	FMN	277	11,200	3,102,400
DEN	LBF	239	10,980	2,635,200
DEN	RIW	293	8,680	2,551,920
DTT	GRB	291	11,270	3,279,570
DTT	PLN	239	13,260	3,169,140
DTT	SSM	294	9,280	2,728,320
ELM	PIT	208	15,820	3,290,560
ELM	WAS	226	17,410	3,934,660
ERI	MDT	218	12,800	2,790,400
ERI	WAS	268	15,160	4,062,880
EUG	SEA	237	8,950	2,026,350
FAT	LAS	258	10,130	2,623,670
FSM	MEM	249	16,290	4,056,210
FVV	MEM	245	8,370	2,050,650
FVV	STL	282	13,580	3,829,560
GEG	PDX	278	12,040	3,347,120
GSO	ORF	275	9,220	1,991,520
GSO	WAS	243	8,390	2,047,160
HPN	ROC	248	14,750	3,658,000
IND	MIK	237	15,980	3,787,260
INL	MSP	253	11,860	3,012,440
ITH	WAS	251	12,960	3,252,960
JAC	SLC	204	13,540	2,775,700
JHW	NYC	291	12,890	3,750,990
LAX	YUM	225	9,920	2,241,920
LBF	UNH	250	8,280	2,070,000
LEX	PIT	289	15,000	4,335,000
LMT	PDX	241	7,730	1,862,930
LWS	PIT	209	8,410	1,727,690
LWS	SEA	262	10,470	2,743,140
MEM	MGM	280	9,100	2,557,100
MEM	MLU	212	14,500	3,074,000
MEM	TXK	255	8,450	2,154,750
MFR	PDX	222	9,300	2,064,600
MRC	MLI	268	13,930	3,747,170
MSP	SUX	233	8,960	2,087,680
MSP	TVF	261	14,380	3,753,180
ORF	RUA	210	14,560	3,072,160
PIT	RDG	225	11,720	2,637,000
PIT	ROC	224	16,170	3,622,080
RIC	IRI	290	7,310	2,119,900
ROC	WAS	292	17,380	5,074,960

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200-299 TRAFFIC DENSITY: 7300-18249

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT PASSENGER
RWI WAS	211	7,630	1,609,930
SBA SFD	271	10,350	2,815,200
SDF TRI	218	15,960	3,479,280
TOTALS	87	1,082,690	273,570,590

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200- 299 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT RS PASSENGER
ABE	BOS	258	33,500	8,643,000
ABE	PIT	252	32,310	8,142,120
ATL	FLO	273	21,530	5,877,690
ATL	GTR	241	23,960	5,774,360
ATL	MEI	266	21,470	5,732,490
ATL	VLD	208	23,230	4,831,840
BAL	BDL	283	36,050	10,202,150
BAL	CHW	271	23,610	6,421,920
BAL	ROC	267	29,140	7,780,380
BHM	MEM	211	29,910	6,340,920
BUF	WAS	290	32,240	9,349,600
CHI	CID	203	28,040	5,692,120
CHI	EAU	270	21,960	6,104,880
CHI	MIL	298	24,970	7,441,060
CHI	PLN	295	18,740	5,528,300
CHI	RHI	273	27,820	8,012,160
CHI	UIN	224	19,090	4,276,160
CHO	NVC	299	27,550	8,237,450
CID	MKC	244	19,120	4,665,280
CID	MSP	221	21,720	4,800,120
CLE	IND	265	23,530	6,258,980
CPR	DEN	231	25,810	5,987,920
CVG	DYY	238	28,420	6,763,960
CVG	ROA	282	20,410	5,755,620
CVG	TRI	216	23,160	5,002,560
DAL	PSM	215	27,510	5,914,650
DAL	FVV	259	20,110	5,208,490
DEN	BDO	238	21,850	5,200,300
DSM	MSP	232	29,300	6,797,600
DTT	TVC	207	31,300	6,479,100
GFK	MSP	284	30,180	8,571,120
GJT	SLC	216	19,380	4,166,080
GRB	MSP	252	23,650	5,959,800
HPN	WAS	240	36,470	8,752,800
HRL	IAR	265	31,330	8,960,360
HVN	WAS	282	28,330	8,017,390
IAH	LFT	201	28,750	5,778,750
INT	WAS	251	24,570	6,167,070
ISO	WAS	247	21,420	5,290,740
JLN	STL	251	29,350	7,366,850
LAS	LAX	226	29,290	6,648,830
MCO	TLH	225	30,030	6,756,750

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200-299 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGER	PER PASSENGER
MEM STL	255	18,320	4,671,600
AKC SYL	229	19,470	4,458,630
MKC SUX	245	18,930	4,637,850
MLI MSP	270	24,100	6,507,000
MLU MSY	203	22,980	4,664,940
MSN MSP	228	18,350	4,183,800
MSP OMA	282	21,030	5,930,460
MSV VPS	226	23,030	5,204,780
OAJ WAS	289	35,410	10,233,490
PHF PHL	205	31,130	6,381,650
PIT SYR	279	35,880	10,010,520
PIT TOL	201	18,510	3,720,510
RDU WAS	224	19,690	4,430,250
TOTALS	55	1,406,940	350,715,220

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200- 299 TRAFFIC DENSITY: 36500- 54749

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGERS	PASSENGER
ALB	BUF	251	48,340	12,133,340
ATL	PFN	247	53,100	13,115,700
AVP	PIT	243	44,990	10,932,570
BNA	MEM	200	47,840	9,568,000
BPT	DAL	251	42,760	10,732,760
BTR	IAH	253	36,800	9,347,200
CHI	CWA	205	51,450	10,547,250
CHI	LSE	229	46,130	10,379,250
CHI	RST	278	47,000	13,066,000
CHI	TVC	226	41,590	9,399,340
DAL	SJT	236	37,330	9,332,500
DAL	TUL	234	50,250	11,758,500
DAY	PIT	214	43,450	9,341,750
DSM	STL	260	37,550	9,763,000
EWN	WAS	263	38,040	10,042,560
IND	STL	229	54,320	12,439,280
LAS	SAN	258	37,700	9,726,600
MKE	MSP	297	49,340	14,653,980
NYC	WAS	215	39,860	8,569,900
TOTALS		19	847,840	204,849,480

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200-299 TRAFFIC DENSITY: 54750- 72999

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGER	RS PASSENGER
ACV	SFO	239	56,300	13,455,700
ALO	CHI	242	61,650	14,967,700
ATL	VPS	250	63,730	15,932,500
BAL	PIT	210	54,830	11,514,300
BUR	LAS	223	60,560	13,565,440
DAL	LIT	283	66,210	18,737,430
DEN	GJT	200	70,060	14,012,000
DII	MKE	244	56,520	13,790,880
FAY	WAS	284	57,840	16,426,560
ISP	WAS	256	60,120	15,390,720
KUA	LTH	269	57,410	15,443,290
LAS	SNA	225	66,830	15,103,580
LAX	MRY	273	55,630	15,186,990
NYC	UHF	291	55,880	16,261,080
ORF	PHL	215	72,490	15,585,350
PHL	PVD	231	65,650	15,165,150
SYH	WAS	297	57,600	17,107,200
TOTALS		17	1,039,510	257,645,870

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200- 299 TRAFFIC DENSITY: 73000- 91249

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGERS	PASSENGER
ATL TRI	226	78,700	17,864,900
BFI GEG	223	82,180	18,326,140
BOS SYR	264	89,130	23,530,320
BTV NYC	261	85,020	22,190,220
DAL TAH	222	83,040	18,434,880
GEG SEA	223	82,180	18,326,140
LH OGG	201	80,680	16,297,360
TOTALS	7	580,930	134,969,960

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB84.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200-299 TRAFFIC DENSITY: 91250-109499

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
ALB PHL	208	93,270	19,400,160
LAS PHX	255	94,670	24,191,850
TOTALS	2	188,140	43,592,010

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 200-299 TRAFFIC DENSITY: 109500- 127749

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
BUF NYC	289	112,200	32,425,800
CHI STL	256	127,040	32,522,240
NYC ROC	252	118,890	29,960,280
TOTALS	3	358,130	94,908,320

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300- 399 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGERS	MILES PASSENGER
ABQ	PHX	328	16,130	5,306,770
ATL	BLF	310	7,380	2,295,180
ATL	LYH	389	14,270	5,551,030
AUS	LBB	335	9,440	3,162,400
BAL	URF	395	15,260	6,027,700
BGM	CLE	304	14,070	4,277,280
BHM	MSY	321	14,710	4,721,910
BNA	GSO	377	11,650	4,392,050
BOI	PDX	344	11,670	4,014,480
BOS	ELM	302	13,200	3,986,400
BTR	DAL	358	10,260	3,673,080
BUF	DAY	353	13,450	4,747,850
BUF	PVD	383	12,060	4,618,980
BZN	SLC	346	8,200	2,845,400
CAK	NYC	391	15,360	6,005,760
CAK	PHL	341	10,590	3,611,190
CHI	CMA	367	10,830	3,974,610
CHI	COU	320	10,000	3,200,000
CHI	HTS	367	7,990	2,932,330
CHI	IWD	350	7,980	2,793,000
CHI	SSM	360	9,020	3,247,200
CMH	MDT	322	7,430	2,392,460
CRE	WAS	360	15,160	5,457,600
CRP	DAL	351	17,470	6,166,910
CVG	RDU	390	7,390	2,882,100
DAL	JLN	320	9,110	2,915,200
DAL	LFT	327	16,740	5,473,980
DAL	SGF	354	16,800	5,947,200
DAY	MDT	393	7,440	2,923,920
DEN	GRI	356	12,300	4,378,800
DEN	SLN	393	8,300	3,261,900
DLC	MKE	342	7,900	2,701,800
DTT	ELM	322	9,460	3,046,120
DTT	MDT	362	7,920	2,667,040
DTT	MDT	363	11,010	3,996,630
DTT	SYR	364	11,030	4,014,920
FSM	STL	323	9,050	2,923,150
GPT	MEM	325	11,340	3,685,500
GSO	SDF	351	8,510	2,987,010
HSV	MSY	379	13,290	5,036,910
IAH	LIT	383	10,430	3,994,690
LAS	SLC	368	13,340	4,909,120

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300- 399 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
LAS	TUS	364	13,030	4,742,920
LAX	SFO	354	11,210	3,979,550
LMT	SFO	305	9,690	2,955,450
LYH	NYC	366	16,240	5,943,840
MCO	VPS	342	10,120	3,461,040
MEM	TUL	342	9,210	3,149,820
MEM	TYS	342	8,920	3,050,640
MFR	SFU	319	9,960	3,177,240
MKC	RST	348	7,350	2,557,800
MKE	SDF	348	10,190	3,546,120
PHL	PRB	339	9,400	3,186,600
ROA	SDF	321	13,700	4,397,700
UCA	WAS	309	12,810	3,958,290
TOTALS		55	616,770	215,454,570

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300- 399 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGER	RS PASSENGER
ABQ	DEN	339	23,100	7,830,900
ABQ	TUS	321	22,700	7,309,400
ALB	PIT	367	33,330	12,232,110
AMA	DEN	359	27,310	9,804,290
ATL	CHE	328	23,850	7,846,650
ATL	MOB	302	19,050	5,753,100
AVL	WAS	377	30,110	11,351,470
BAL	CMH	336	19,240	6,464,640
BAL	PVD	328	21,780	7,143,840
BIL	SLC	387	20,450	7,914,150
BNA	CLT	328	20,240	6,658,960
BUR	PHX	369	21,500	7,933,500
CHI	ERI	391	29,410	11,499,310
CHI	MOT	322	24,700	7,953,400
CLE	SYR	312	31,650	9,874,800
CMH	MKE	331	20,360	6,739,160
CVG	MKE	318	19,050	6,057,900
DAL	MAF	319	20,300	6,759,900
DAY	STL	339	21,540	7,302,060
DEN	RAP	309	33,520	10,391,200
ERI	PHL	304	33,480	10,177,920
FSD	MKC	327	18,840	6,160,680
GOU	WAS	322	32,010	10,307,220
IAH	MSY	303	27,970	8,474,910
ILM	WAS	320	29,900	9,597,900
IWO	PIT	324	21,380	6,948,500
ITO	LIH	317	22,490	7,151,820
LAS	SJC	391	34,400	13,450,400
MEN	MOB	317	18,380	5,844,840
ONT	PHX	322	30,730	9,895,060
ORF	PIT	330	23,150	7,639,500
TRI	WAS	328	26,710	8,760,880
TOTALS		32	802,630	269,230,370

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300-399 TRAFFIC DENSITY: 36500-54749

CITY-PAIRS		DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
		MILES	PASSENGER	R\$ PASSENGER
ATL	GPT	352	38,660	13,608,320
ATL	ILM	377	47,650	17,964,050
BDL	BUF	317	41,350	13,107,950
BOS	MDT	336	43,180	14,551,660
CHI	DSM	306	44,510	13,620,060
DEN	SLC	381	53,830	20,509,230
ERI	NYC	335	45,000	15,075,000
IAH	MFE	308	38,440	11,839,520
MKE	STL	317	44,890	14,230,130
NYC	ROA	399	52,750	21,047,250
PIT	SUP	339	38,830	13,008,050
TOTALS		11	489,090	168,561,220

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300- 399 TRAFFIC DENSITY: 54750- 72999

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGERS	PASSENGER
ATL ROA	357	69,880	24,947,160
BUS BUF	396	64,340	25,478,640
CHI MSP	344	58,900	20,261,600
TOTALS	3	193,120	70,687,400

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300-399 TRAFFIC DENSITY: 73000- 91249

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
BOS ROC	343	78,650	26,976,950
LAS RNO	345	79,890	27,562,050
PHX SNA	340	86,630	29,454,200
TOTALS	3	245,170	83,993,200

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB84.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300- 399 TRAFFIC DENSITY: 91250- 109499

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT RS PASSENGER
ALB WAS	321	102,930	33,040,530
ATL FAY	330	96,020	31,686,600
PVD WAS	364	107,460	39,115,440
TOTALS	3	306,410	103,842,570

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.V6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 300- 399 TRAFFIC DENSITY: 146000- 164249

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
BAL BOS	370	154,660	57,224,200
BDL WAS	319	161,330	51,464,270
TOTALS	2	315,990	108,688,470

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 400-499 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS		TRAFFIC UNITS	
	MILES	PASSENGERS	PASSENGER
ATL CHO	456	7,500	3,427,500
BFI SUI	400	11,310	4,524,000
BHM MCO	475	16,910	8,032,250
BNA RDU	443	10,500	4,651,500
BWI SEA	400	11,310	4,524,000
BOS WAS	406	10,930	4,437,580
BTV WAS	439	12,980	5,698,220
BUF CVG	410	9,590	3,931,900
BUF IND	450	10,470	4,711,500
CAK STL	497	13,500	6,709,500
CHI JLN	485	9,870	4,786,950
CMH NYC	472	10,270	4,847,440
CMH PHL	412	17,680	7,284,160
CHW NYC	438	18,230	7,984,740
DAL LOI	402	11,160	4,486,320
DAL ROW	447	13,410	6,195,420
DAY PHL	483	13,430	6,486,690
DAY SYR	475	7,680	3,648,000
DEN FSD	496	8,140	4,037,440
DEN JAC	402	15,140	6,086,280
DEN LBB	454	13,420	6,092,680
DEN MHK	441	7,530	3,320,730
DEN UMA	484	14,580	7,056,720
GRR MSP	408	9,450	3,855,600
HTS NYC	486	9,060	4,403,160
HTS PHL	413	1,560	3,122,280
IAH LBB	466	8,100	3,774,600
ILM NYC	495	15,420	7,632,900
INT NYC	464	13,360	6,199,040
ISO NYC	423	13,310	5,630,130
LAS DAK	408	8,650	3,529,200
LAS SFO	419	12,610	5,283,590
MCO MGM	400	9,540	3,816,000
MEM TRI	436	9,250	4,042,250
MKE MKE	438	15,170	6,644,460
MSP SLC	435	12,390	5,402,040
MSP RAP	490	9,630	4,718,700
NYC PAB	407	8,260	3,361,820
ORF PVD	420	14,170	5,951,400
PHL TOL	470	14,950	7,026,500
HIC SUR	463	10,830	5,014,290
SNA TUS	418	16,930	7,076,740

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AJA TRANSPORTATION
STUDY

DISTANCE RANGE: 400- 499 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER HS	TRAFFIC-DISTANCE PRODUCT PASSENGER
TOTALS	42	494,180	219,446,220

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 400-499 TRAFFIC DENSITY: 18250-36499

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT PASSENGER
RS				
ALB	CLE	419	31,080	13,022,520
ATL	EWN	433	21,220	9,188,260
ATL	ISO	405	18,570	7,539,420
ATL	OAJ	407	34,780	14,155,460
BAL	SUF	493	18,450	9,132,750
BIL	DEN	456	23,260	10,629,820
BNA	PIT	461	18,500	8,547,000
CHI	NEM	485	21,830	10,587,550
CHI	SGF	438	24,210	10,603,980
CMH	STL	410	29,540	12,111,400
DAL	HRL	458	24,270	11,164,200
DAL	MFE	467	28,900	13,554,100
DAL	MKC	448	21,060	9,434,880
DEN	LNX	435	20,090	8,739,150
DEN	SUX	479	30,820	14,762,780
EUG	SFO	440	25,920	11,404,800
FAY	NYC	478	29,150	13,933,700
MOT	MSP	449	19,570	8,786,930
PIT	PVD	467	23,120	10,797,040
TOTALS		19	464,340	208,095,740

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 400-499 TRAFFIC DENSITY: 36500- 54749

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGER	PASSENGER
BAL CVG	430	43,650	18,769,500
BUS DDF	468	50,890	23,816,520
CHI FSD	471	53,570	25,231,470
CHI SUX	444	47,590	21,129,960
MIA TLH	403	36,670	14,778,010
TOTALS	5	232,370	103,725,460

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 400-499 TRAFFIC DENSITY: 54750- 72999

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGER RS	PASSENGER
BDL PIT	406	58,390	23,706,340
CHI DLH	407	55,910	22,592,570
LAX TUS	438	57,420	25,149,960
MSP STL	448	70,380	31,530,240
TOTALS	4	241,700	102,979,110

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 400-499 TRAFFIC DENSITY: 73000- 91249

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
BOS PIT	496	75,830	37,611,680
CHI PIT	404	82,250	33,229,000
TOTALS	2	158,080	70,840,680

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 500- 599 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGERS	PASSENGER
ACV LAX	584	11,390	6,651,760
AMA IAH	528	11,130	5,876,640
ATL WAS	540	9,090	4,908,600
AVL NYC	592	17,310	10,247,520
BDL CMH	549	14,160	7,788,000
BNA ORF	585	9,730	5,692,050
BNA RIC	527	10,490	5,528,230
BUS CLE	558	7,350	4,101,300
CHI ELM	559	16,770	9,374,430
CHI INL	537	9,290	4,988,730
CHI IPT	563	7,790	4,365,770
CHI ROA	521	15,430	8,039,030
CLT MEM	512	15,030	7,645,360
CMI WAS	595	14,990	8,919,050
CVG MSP	596	9,780	5,828,880
DAL DMA	585	12,070	7,060,950
DAY MSP	575	13,630	7,837,250
DAY NYC	543	13,550	7,357,650
DEN OKC	500	7,640	3,820,000
GEG SLC	547	16,350	8,943,450
GSO MEM	569	10,220	5,825,400
LAX SLC	583	7,330	4,273,390
LEX NYC	598	14,460	8,647,030
LEX PHL	526	7,340	3,860,840
MIA VPS	500	8,540	4,270,000
ORF SDF	531	11,230	5,963,130
PDX SFO	540	8,180	4,417,200
SLC SNA	587	17,790	10,442,730
TOTALS	28	328,060	182,744,420

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 500-599 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENSE RS	PASSENGER
ABQ DAL	580	35,870	21,306,780
ATL URF	516	28,860	14,902,080
BAL IND	515	27,310	14,064,650
BDL DTT	540	27,000	14,580,000
BIS DEN	526	26,210	13,786,460
DEN PHX	589	34,300	20,202,700
DTT MSP	534	33,040	17,643,360
NYC TRI	542	25,720	13,615,040
PIT STL	553	31,680	17,550,720
TOTALS	9	269,470	147,651,790

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 500- 599 TRAFFIC DENSITY: 36500- 54749

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT PASSENGER
DAL STL	537	49,190	26,415,030
DEN MKC	552	44,840	24,751,680
PHL SDF	583	43,430	25,319,690
TOTALS	3	137,460	76,486,400

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 500-599 TRAFFIC DENSITY: 54750 = 72999

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGERS	PASSENGER
CHI MDT	584	59,930	34,999,120
PHX SLC	507	59,620	30,227,340
TOTALS	2	119,550	65,226,460

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 600- 699 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGER	PASSENGER
ABE CHI	647	10,850	7,019,950
ALO DEN	677	15,460	10,481,880
BDL CVG	661	8,070	5,334,270
BDL DAY	619	15,990	9,897,810
BGM CHI	607	15,130	9,183,910
BHM MIA	661	12,300	8,130,300
BOS DTT	623	10,170	6,335,910
CHI GFK	623	18,110	11,282,530
CHI JAN	672	8,710	5,853,120
CMH MSP	627	8,490	5,323,230
CSG WAS	617	15,850	9,779,450
DAL MLI	682	7,380	5,047,920
DEN GTF	624	10,090	6,296,160
DEN MDT	612	16,500	10,114,500
DTT PVD	606	10,840	6,569,040
NYC SDF	653	7,780	5,080,340
PDX SLC	630	14,960	9,387,000
PHX RNO	600	11,310	6,797,310
PHX SFO	657	7,660	5,032,620
PTR WAS	673	10,100	6,797,300
SLC TUS	600	10,150	6,090,000
TOTALS	21	245,840	155,834,550

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 600- 699 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
BFI	KTN	676	25,320	17,116,320
BFI	SLC	690	25,490	17,613,590
BNA	PHL	681	33,420	22,759,020
KTN	SEA	676	25,320	17,116,320
MCO	MEM	681	19,070	12,986,670
MEM	PIT	651	20,560	13,405,120
PHX	SJC	627	27,130	17,010,510
SEA	SLC	691	25,490	17,613,590
TOTALS		8	201,800	135,621,140

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 600- 699 TRAFFIC DENSITY: 36500- 54749

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGER	PASSENGER
ABQ LAX	665	42,860	28,501,900
AVP CHI	624	42,170	26,514,080
DEN MSP	692	52,470	36,361,710
DEN TUS	627	37,600	23,575,200
IND NYC	654	38,590	25,237,860
TOTALS	5	213,690	139,990,750

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 600- 699 TRAFFIC DENSITY: 54750- 72999

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
DEN LAS	616	72,780	44,832,480
TOTALS	1	72,780	44,832,480

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABD84.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 600- 699 TRAFFIC DENSITY: 73000- 91249

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGER	TRAFFIC-DISTANCE PRODUCT RS PASSENGER
DAL DEN	654	78,340	52,017,760
TOTALS	1	78,340	52,017,760

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TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE:CABDB4.Y6872.SYNC PERIOD:1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 700- 799 TRAFFIC DENSITY: 7300- 18249

CITY-PAIRS		DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
AUS	DEN	769	7,970	6,128,930
BAL	STL	737	15,500	11,423,500
BDL	IND	727	17,510	12,747,280
BOS	CVG	752	7,700	5,790,400
CHI	MOT	793	15,310	12,140,830
CHI	NYC	721	12,280	8,853,880
CMI	NYC	755	14,820	11,189,100
DAL	GJT	783	8,200	6,519,000
DEN	SAT	794	15,070	11,965,580
EUG	LAX	752	14,330	10,776,160
EVV	NYC	748	12,110	9,058,280
GRB	NYC	765	7,300	5,584,500
MEM	ORF	781	10,500	8,211,000
MSP	RUC	783	7,860	6,154,380
VPS	WAS	783	13,480	10,554,840
TOTALS		15	179,940	137,097,660

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB84.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 700- 799 TRAFFIC DENSITY: 18250- 36499

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGER	PASSENGER
BUF MSP	734	25,730	18,885,820
TOTALS	1	25,730	18,885,820

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 700-799 TRAFFIC DENSITY: 36500- 54749

CITY-PAIRS	DISTANCE UNITS	TRAFFIC UNITS	TRAFFIC-DISTANCE PRODUCT
	MILES	PASSENGERS	PASSENGER
DEN STL	781	53,720	41,955,320
TOTALS	1	53,720	41,955,320

TRAFFIC RANGE AND DENSITY REPORT FOR ORIGIN/DESTINATION CITY-PAIRS

DATA SOURCE: CABDB4.Y6872.SYNC PERIOD: 1972

MEDIUM DENSITY
AIR TRANSPORTATION
STUDY

DISTANCE RANGE: 700- 799 TRAFFIC DENSITY: 73000- 91249

CITY-PAIRS	DISTANCE UNITS MILES	TRAFFIC UNITS PASSENGERS	TRAFFIC-DISTANCE PRODUCT PASSENGER
MKE NYC	733	85,930	62,986,690
TOTALS	1	85,930	62,986,690

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B.2 INITIAL MEDIUM DENSITY NETWORK AND TRAFFIC MODEL

The following series of tables describe the initial medium density network and traffic model. Computer printout sheets are included for a representative part of the total model. Table B-2 lists each airport pair in a range class together with data derived from the 1972 schedule of airline service. Each range class becomes a model element for which pertinent data are summarized in a line of data identified by the range limits. Each piece of data is identified by headings at the top of each page. Table B-3 lists the summary data for each numbered element in the mission model. Essential data are identified by column headers. Table B-4 is the total traffic model with the base year of 1972. Service class refers to the geographic region and airline, passengers per day is equivalent to segment seats demanded per day where a segment is an airport pair route; passengers per day, passengers per trip and seats per trip are not essential to the analysis in this study; the minimum trips is the number of trips actually scheduled in the base year of 1972. Table B-5 is a printout from the operational simulation routine which shows the basic schedule and demand data for 1980 in each of the six geographic regions. Passengers are interpreted as demand for seats by segment and should not be confused with Origin and Destination passengers as recorded by the CAB. The pertinent trips per year is the last column labeled minimum trips, which is the minimum service level to be met by any candidate aircraft.

TABLE B-2

ROUTE DATA BY EQUIPMENT TYPE F7
EQUIPMENT TYPE F7

Page 1 of 3

RANGE CLASS		TRIPS/DAY	SEATS/DAY	SEATS/TRIP	SEAT-MILES	TRIP-MILES	RANGE BAR	RCLASS	TCLASS	NCP	TIME/TRIP
SFA	-	TIW	5.00	200.	18	4					
TIW	-	SFA	5.00	200.	18	4					
OLM	-	TIW	5.00	200.	25	4					
TIW	-	OLM	5.00	200.	25	4					
LWS	-	PIW	14.00	560.	26	4					
PIW	-	LWS	21.00	840.	26	4					
SFO	-	SJC	7.00	280.	31	4					
SJC	-	SFO	7.00	280.	31	4					
FAT	-	EPH	10.00	400.	33	4					
EPH	-	FAT	10.00	400.	33	4					
LAX	-	SNA	5.00	200.	37	4					
SNA	-	LAX	5.00	200.	37	4					
APV	-	ONT	7.00	280.	40	4					
ONT	-	APV	7.00	280.	40	4					
ALW	-	PSC	14.00	560.	41	4					
PSC	-	ALW	7.00	280.	41	4					
HQM	-	OLM	5.00	200.	49	4					
LAX	-	OXR	10.00	400.	49	4					
OLM	-	HQM	5.00	200.	49	4					
OXR	-	LAX	10.00	400.	49	4					
IDA	-	PIH	20.00	800.	50	4					
PIH	-	IDA	14.00	560.	50	4					
1-	50	28.29	1131.	40.	42257.	1056.	37	11.	4	22	0.32
CIC	-	RDD	13.00	520.	55	4					
PRB	-	SMX	12.00	480.	55	4					
RDD	-	CIC	13.00	520.	55	4					
SMX	-	PRB	12.00	480.	55	4					
LAX	-	PMO	14.00	560.	56	4					
PMO	-	LAX	14.00	560.	56	4					
AST	-	HQM	5.00	200.	57	4					
HQM	-	AST	5.00	200.	57	4					
FAT	-	YKM	14.00	560.	59	4					
YKM	-	FAT	7.00	280.	59	4					
APV	-	PMO	7.00	280.	60	4					
PMO	-	APV	7.00	280.	60	4					
IPL	-	YUM	14.00	560.	63	4					
YUM	-	IPL	14.00	560.	63	4					
ALW	-	LWS	14.00	560.	64	4					
GEO	-	PIW	19.00	760.	64	4					
LWS	-	ALW	7.00	280.	64	4					
PIW	-	GEO	12.00	480.	64	4					
SCK	-	SFO	6.00	240.	65	4					
SFO	-	SCK	6.00	240.	65	4					
SFO	-	STS	10.00	400.	65	4					
STS	-	SFO	10.00	400.	65	4					
TYK	-	PMO	5.00	200.	67	4					
PMO	-	TYK	5.00	200.	67	4					
CEC	-	EKA	13.00	520.	68	4					
EKA	-	CEC	13.00	520.	68	4					
BKE	-	OND	5.00	200.	69	4					
OND	-	BKE	5.00	200.	69	4					
PSC	-	YKM	5.00	200.	72	4					
PIW	-	ALW	7.00	280.	72	4					
YKM	-	PSC	5.00	200.	72	4					
AST	-	PDX	5.00	200.	73	4					
PDX	-	AST	5.00	200.	73	4					
GON	-	PGA	7.00	280.	77	4					
PGA	-	GON	7.00	280.	77	4					

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BFL	-	SDF	7.00	400.	94	4
SBA	-	BFL	7.00	280.	82	4
CVO	-	PDX	13.00	520.	83	4
PDX	-	CVO	13.00	520.	83	4
OXR	-	SMX	10.00	400.	85	4
SMX	-	OXR	10.00	400.	85	4
SFO	-	SMF	34.00	1360.	86	4
SMF	-	SFO	34.00	1360.	86	4
PHX	-	PRC	10.00	400.	87	4
PRC	-	PHX	10.00	400.	87	4
CVO	-	OTH	13.00	520.	88	4
OTH	-	CVO	13.00	520.	88	4
IGM	-	LAS	10.00	400.	89	4
LAS	-	TGM	10.00	400.	89	4
LWS	-	GFG	7.00	280.	90	4
IGM	-	PRC	10.00	400.	95	4
PRC	-	IGM	10.00	400.	95	4
SFA	-	EAT	7.00	280.	98	4

1-	100	73.57	3143.	40.	229583.	5740.	73	11.	4	53.	0.47
LWS	-	PSC	7.00	280.	101	4					
PSC	-	PUW	7.00	280.	101	4					
SEA	-	YKM	14.00	560.	103	4					
YKM	-	SFA	14.00	560.	103	4					
BLH	-	PSP	5.00	200.	104	4					
PSP	-	BLH	5.00	200.	104	4					
CDC	-	PGA	7.00	280.	106	4					
PGA	-	CDC	7.00	280.	106	4					
BFL	-	LAX	6.00	240.	109	4					
LAX	-	BFL	6.00	240.	109	4					
LAX	-	PSP	18.00	720.	109	4					
PSP	-	LAX	18.00	720.	109	4					
YKM	-	ALW	7.00	280.	112	4					
CEC	-	OTH	13.00	520.	114	4					
OTH	-	CEC	13.00	520.	114	4					
BKE	-	PSC	5.00	200.	116	4					
PDX	-	RDM	7.00	280.	116	4					
PSC	-	BKE	5.00	200.	116	4					
RDM	-	PDX	7.00	280.	116	4					
LMT	-	RDD	7.00	280.	118	4					
RDD	-	LMT	7.00	280.	118	4					
PDX	-	YKM	5.00	200.	119	4					
YKM	-	PDX	5.00	200.	119	4					
LAS	-	LHU	5.00	200.	120	4					
LHU	-	LAS	5.00	200.	120	4					
PDX	-	SEA	7.00	280.	129	4					
SEA	-	PDX	7.00	280.	129	4					
LAX	-	SMX	10.00	400.	134	4					
SMX	-	LAX	10.00	400.	134	4					
TPL	-	SNA	5.00	200.	139	4					
SNA	-	TPL	5.00	200.	139	4					
LMT	-	RDM	7.00	280.	148	4					
RDM	-	LMT	7.00	280.	148	4					

		37.57	1503.	40.	174720.	4368.	116	11.	4	33	0.68
1-	150										
CIC	-	SFO	13.00	120.	152	4					
SFO	-	CIC	13.00	120.	152	4					
BLH	-	PHX	5.00	10.	156	4					
PHX	-	BLH	5.00	10.	156	4					
SFO	-	TVL	5.00	10.	156	4					
TVL	-	SFO	5.00	200.	156	4					
PHX	-	YUM	14.00	560.	160	4					
YUM	-	PHX	14.00	560.	160	4					
PRB	-	SFO	12.00	480.	166	4					
SFO	-	PRB	12.00	480.	166	4					
PDX	-	RBG	5.00	200.	167	4					
RBG	-	PDX	5.00	200.	167	4					
GCN	-	LAS	14.00	560.	169	4					

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LHD	-	SEA	14.00	200.	102	4							
PSC	-	SEA	14.00	560.	172	4							
SEA	-	PSC	7.00	280.	172	4							
LAS	-	PSP	7.00	280.	173	4							
PSP	-	LAS	7.00	280.	173	4							
GDN	-	PHX	7.00	280.	174	4							
PHX	-	GDN	7.00	280.	174	4							
IPL	-	LAX	14.00	560.	176	4							
LAX	-	TPL	14.00	560.	176	4							
BOI	-	PIH	14.00	560.	188	4							
PIH	-	BOI	20.00	800.	188	4							
RNO	-	SJC	7.00	280.	188	4							
SJC	-	RNO	7.00	280.	188	4							
LAS	-	DNT	28.00	1120.	197	4							
DNT	-	LAS	28.00	1120.	197	4							
BOI	-	LWS	7.00	280.	198	4							
LWS	-	BOI	7.00	280.	198	4							
RDO	-	SFO	7.00	280.	199	4							
SFO	-	RDO	7.00	280.	199	4							
151-	200		49.29	1971.	40.		348286.	8707.	176	11.	4	32	0.93
BOI	-	IDA	5.00	240.	209	4							
CDC	-	SLC	7.00	280.	221	4							
SLC	-	CDC	7.00	280.	221	4							
BUR	-	LAS	2.00	80.	222	4							
LAS	-	BUJ	2.00	80.	222	4							
BFL	-	LAS	7.00	280.	223	4							
LAS	-	BFL	7.00	280.	223	4							
BOI	-	PUW	5.00	200.	224	4							
PUW	-	BOI	5.00	200.	224	4							
LAX	-	LHU	5.00	200.	234	4							
LHU	-	LAX	5.00	200.	234	4							
LMT	-	SME	7.00	280.	238	4							
SME	-	LMT	7.00	280.	238	4							
EKA	-	SFO	13.00	520.	240	4							
SFO	-	EKA	13.00	520.	240	4							
LMT	-	PDX	7.00	280.	241	4							
PDX	-	LMT	7.00	280.	241	4							
SRA	-	SFO	7.00	280.	263	4							
SFO	-	SRA	7.00	280.	263	4							
201-	300		18.00	720.	40.		168949.	4224.	234	11.	4	19	1.18
TOTALS			211.71	8469.	40.		963794.	24095.	113			159	0.65

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TABLE B-3
SUMMARY OF ROUTE DATA BY
MODEL ELEMENT NUMBER

EQUIPMENT F7

ELEMENT NO.	EQUPT	RANGE	SEATS/DAY FRACTION	TRIPS/DAY FRACTION	SEAT-MILES FRACTION	TRIP-MILES FRACTION	RANGE CLASS	SERVICE CLASS	AIRPORT PAIRS
114	F7	37.	1131.0 *****28.28999329	28.3 0.000025468	42257. 0.000079308	1056. 0.000431087	11.	4	22
115	F7	73.	3143.0 *****78.56999207	78.6 0.000138370	229583. 0.000105304	5740. 0.000328047	11.	4	53
116	F7	116.	1503.0 *****37.56999207	37.6 0.000209912	174720. 0.000653916	4368. 0.000317232	11.	4	33
117	F7	176.	1971.0 *****49.28999329	49.3 0.000105304	348286. 0.00026169	8707. 0.00038711	11.	4	32
118	F7	234.	720.0 *****18.00000000	18.0 0.000580879	168949. 0.000101825	4224. 0.001809591	11.	4	19
EQUIPMENT TOTALS			8468. 0.00326169	212. 0.00638711	963795. 0.000580879	24095. 0.001809591			159

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TABLE B-4

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1972
AIR TRANSPORTATION FORECAST

SERVICE CLASS	RANGE ST. MI	PSNGRS /DAY	TRIPS /DAY	SEATS /DAY	PSNGR /TRIP	SEATS /TRIP	MIN.	TRIPS	OPERATION CLASS
1	43	435	120	888	3.6	7.4	12	11	
1	69	1849	510	3774	3.6	7.4	51	11	
1	126	2865	790	5846	3.6	7.4	79	11	
1	184	1342	370	2738	3.6	7.4	37	11	
1	253	4206	1160	8584	3.6	7.4	116	11	
1	349	1777	490	3626	3.6	7.4	49	11	
1	443	254	70	518	3.6	7.4	7	11	
1	535	109	30	222	3.6	7.4	3	11	
1	642	73	20	148	3.6	7.4	2	11	
1	72	175	239	358	0.7	1.5	24	11	
1	121	103	140	210	0.7	1.5	14	11	
1	32	219	297	446	0.7	1.5	30	11	
3	43	23	30	45	0.8	1.5	3	11	
3	65	78	100	150	0.8	1.5	10	11	
1	78	624	849	1273	0.7	1.5	85	11	
1	109	170	231	347	0.7	1.5	23	11	
3	135	31	40	60	0.8	1.5	4	11	
3	160	8	10	15	0.8	1.5	1	11	
1	173	78	106	159	0.7	1.5	11	11	
1	36	1106	451	2257	2.4	5.0	45	11	
2	43	1358	571	2743	2.4	4.8	57	11	
3	43	1300	500	2500	2.6	5.0	50	11	
3	70	3633	1397	6986	2.6	5.0	140	11	
1	72	2548	1040	5200	2.4	5.0	104	11	
2	73	6171	2596	12467	2.4	4.8	260	11	
1	121	2275	929	4643	2.4	5.0	93	11	
2	122	2359	993	4766	2.4	4.8	99	11	
3	124	2931	1127	5636	2.6	5.0	113	11	
3	173	1493	574	2871	2.6	5.0	57	11	
1	174	2587	1056	5279	2.5	5.0	106	11	
2	175	563	257	1138	2.4	4.8	24	11	
3	234	988	380	1900	2.6	5.0	38	11	
1	238	1687	689	3443	2.4	5.0	69	11	
2	239	720	303	1454	2.4	4.8	30	11	
1	320	154	63	314	2.4	5.0	6	11	
2	325	129	54	261	2.4	4.8	5	11	
3	339	130	50	250	2.6	5.0	5	11	
3	404	208	80	400	2.6	5.0	8	11	
1	536	49	20	100	2.4	5.0	2	11	
5	40	434	221	886	2.0	4.0	22	11	
5	76	1638	836	3343	2.0	4.0	84	11	
5	124	1176	600	2400	2.0	4.0	60	11	
5	173	627	320	1280	2.0	4.0	32	11	
5	239	221	113	451	2.0	4.0	11	11	
5	369	20	10	40	2.0	4.0	1	11	
2	35	68	19	137	3.6	7.4	2	11	
5	38	357	97	729	3.7	7.5	10	11	
4	38	195	54	407	3.6	7.5	5	11	
2	74	487	133	983	3.7	7.4	13	11	
5	75	3003	817	6129	3.7	7.5	82	11	

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1972
AIR TRANSPORTATION FORECAST

SERVICE CLASS	RANGE ST. MI	PSNGRS /DAY	TRIPS /DAY	SEATS /DAY	PSNGR /TRIP	SEATS /TRIP	MIN. TRIPS	OPERATION CLASS
4	76.	143.	40.	300.	3.6	7.5	4.	11.
4	110.	251.	70.	525.	3.6	7.5	7.	11.
2	128.	549.	150.	1110.	3.7	7.4	15.	11.
5	128.	1859.	506.	3793.	3.7	7.5	51.	11.
4	173.	179.	50.	375.	3.6	7.5	5.	11.
5	176.	2656.	723.	5421.	3.7	7.5	72.	11.
2	179.	178.	49.	359.	3.7	7.4	5.	11.
4	235.	522.	146.	1093.	3.6	7.5	15.	11.
5	238.	2672.	781.	5861.	3.7	7.5	78.	11.
2	255.	623.	170.	1258.	3.7	7.4	17.	11.
5	333.	782.	213.	1596.	3.7	7.5	21.	11.
4	350.	532.	149.	1114.	3.6	7.5	15.	11.
2	439.	131.	36.	264.	3.7	7.4	4.	11.
4	450.	72.	20.	150.	3.6	7.5	2.	11.
5	454.	609.	166.	1243.	3.7	7.5	17.	11.
2	563.	73.	20.	148.	3.7	7.4	2.	11.
5	579.	73.	20.	150.	3.7	7.5	2.	11.
5	642.	431.	117.	879.	3.7	7.5	12.	11.
2	660.	37.	10.	74.	3.7	7.4	1.	11.
5	784.	110.	30.	225.	3.7	7.5	3.	11.
5	866.	73.	20.	150.	3.7	7.5	2.	11.
4	27.	471.	96.	986.	4.9	10.3	10.	11.
2	41.	250.	51.	505.	4.9	9.8	5.	11.
1	49.	7.	1.	14.	4.9	10.0	0.	11.
1	72.	1323.	270.	2700.	4.9	10.0	27.	11.
2	75.	3358.	691.	6784.	4.9	9.8	69.	11.
4	76.	964.	196.	2016.	4.9	10.3	20.	11.
4	118.	2166.	440.	4532.	4.9	10.3	44.	11.
2	125.	2819.	579.	5695.	4.9	9.8	58.	11.
1	125.	1470.	300.	3000.	4.9	10.0	30.	11.
4	177.	457.	93.	956.	4.9	10.3	9.	11.
2	179.	1763.	363.	3562.	4.9	9.8	36.	11.
1	188.	1421.	290.	2900.	4.9	10.0	29.	11.
4	246.	2651.	539.	5547.	4.9	10.3	54.	11.
2	249.	3726.	767.	7528.	4.9	9.8	77.	11.
1	252.	5439.	1110.	11100.	4.9	10.0	111.	11.
2	325.	443.	91.	895.	4.8	9.8	9.	11.
1	339.	2695.	550.	5500.	4.9	10.0	55.	11.
4	351.	1554.	316.	3252.	4.9	10.3	32.	11.
1	425.	2240.	457.	4571.	4.9	10.0	46.	11.
4	450.	464.	94.	971.	4.9	10.3	9.	11.
2	461.	466.	97.	942.	4.8	9.7	10.	11.
1	528.	245.	50.	500.	4.9	10.0	5.	11.
4	537.	584.	119.	1221.	4.9	10.3	12.	11.
2	560.	466.	97.	942.	4.8	9.7	10.	11.
4	629.	204.	41.	427.	4.9	10.3	4.	11.
1	658.	392.	80.	800.	4.9	10.0	8.	11.
2	691.	294.	60.	594.	4.9	9.9	6.	11.
1	732.	294.	60.	600.	4.9	10.0	6.	11.
2	736.	378.	77.	764.	4.9	9.9	8.	11.

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1972
AIR TRANSPORTATION FORECAST

SERVICE CLASS	RANGE ST, MI	PSNGRS /DAY	TRIPS /DAY	SEATS /DAY	PSNGR /TRIP	SEATS /TRIP	MIN.	TRIPS	OPERATION CLASS
4	783.	42.	19.	88.	4.9	10.2	1.	1.	11.
1	873.	98.	20.	200.	4.9	10.0	2.	2.	11.
4	973.	14.	3.	29.	4.8	10.0	0.	0.	11.
1	33.	139.	64.	283.	2.2	4.4	6.	6.	11.
2	43.	556.	244.	1124.	2.3	4.6	24.	24.	11.
1	73.	1001.	464.	2043.	2.2	4.4	46.	46.	11.
2	77.	2957.	1299.	5973.	2.3	4.6	130.	130.	11.
1	117.	413.	191.	842.	2.2	4.4	19.	19.	11.
2	126.	1704.	749.	3443.	2.3	4.6	75.	75.	11.
1	166.	123.	57.	251.	2.2	4.4	6.	6.	11.
2	180.	511.	224.	1032.	2.3	4.6	22.	22.	11.
1	228.	160.	74.	327.	2.2	4.4	7.	7.	11.
2	249.	140.	61.	283.	2.3	4.6	6.	6.	11.
4	37.	541.	283.	1131.	1.9	4.0	28.	28.	11.
4	73.	1502.	786.	3143.	1.9	4.0	79.	79.	11.
4	116.	718.	376.	1503.	1.9	4.0	38.	38.	11.
4	176.	942.	493.	1971.	1.9	4.0	49.	49.	11.
4	234.	344.	180.	720.	1.9	4.0	18.	18.	11.
1	54.	90.	14.	183.	0.8	1.6	11.	11.	11.
5	38.	608.	310.	1240.	2.0	4.0	31.	31.	11.
5	78.	1655.	844.	3377.	2.0	4.0	84.	84.	11.
5	131.	490.	250.	1000.	2.0	4.0	25.	25.	11.
5	164.	577.	294.	1177.	2.0	4.0	29.	29.	11.
5	249.	84.	43.	171.	2.0	4.0	4.	4.	11.
1	25.	191.	150.	390.	1.3	2.6	15.	15.	11.
1	120.	153.	120.	312.	1.3	2.6	12.	12.	11.
1	35.	114.	123.	233.	0.9	1.9	12.	12.	11.
3	45.	50.	60.	96.	0.8	1.6	6.	6.	11.
1	67.	545.	586.	1113.	0.9	1.9	59.	59.	11.
3	88.	67.	80.	128.	0.8	1.6	8.	8.	11.
3	125.	67.	80.	128.	0.8	1.6	8.	8.	11.
2	176.	129.	157.	261.	0.9	1.9	14.	14.	11.
1	34.	1079.	367.	2203.	2.9	6.0	57.	57.	11.
1	75.	3453.	1174.	7046.	2.9	6.0	117.	117.	11.
1	123.	1441.	490.	2940.	2.9	6.0	49.	49.	11.
1	170.	828.	281.	1689.	2.9	6.0	28.	28.	11.
1	251.	681.	231.	1389.	2.9	6.0	23.	23.	11.
1	347.	172.	59.	351.	2.9	6.0	6.	6.	11.
6	30.	1182.	110.	1738.	10.7	15.8	11.	11.	11.
6	92.	231.	21.	339.	10.8	15.8	2.	2.	11.
6	114.	3454.	321.	5079.	10.7	15.8	32.	32.	11.
6	296.	1535.	143.	2257.	10.7	15.8	14.	14.	11.
6	336.	9408.	876.	13836.	10.7	15.8	88.	88.	11.
6	447.	614.	57.	903.	10.8	15.8	6.	6.	11.
6	83.	226.	30.	333.	7.5	11.1	3.	3.	11.
6	115.	377.	50.	555.	7.5	11.1	5.	5.	11.
6	158.	43.	6.	63.	7.5	11.1	1.	1.	11.
6	209.	43.	6.	63.	7.5	11.1	1.	1.	11.
6	346.	517.	69.	761.	7.5	11.1	7.	7.	11.
6	447.	216.	29.	317.	7.5	11.1	3.	3.	11.

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1972
AIR TRANSPORTATION FORECAST

SERVICE CLASS	RANGE ST. #I	PSNGRS /DAY	TRIPS /DAY	SEATS /DAY	PSNGR /TRIP	SEATS /TRIP	MIN. TRIPS	OPERATION CLASS
6	30.	1385.	221.	2037.	6.3	9.2	22.	11.
3	57.	50.	10.	97.	5.0	9.7	1.	11.
3	59.	137.	27.	263.	5.0	9.7	3.	11.
1	80.	1455.	350.	2970.	4.4	9.0	33.	11.
6	81.	2271.	326.	3339.	7.0	10.3	33.	11.
3	106.	353.	70.	679.	5.0	9.7	7.	11.
6	112.	1142.	150.	1680.	7.6	11.2	15.	11.
1	141.	939.	213.	1916.	4.4	9.0	21.	11.
6	158.	261.	54.	384.	7.6	11.2	3.	11.
3	175.	577.	114.	1109.	5.0	9.7	11.	11.
1	181.	1336.	303.	2726.	4.4	9.0	30.	11.
6	212.	588.	77.	864.	7.6	11.2	8.	11.
3	224.	792.	157.	1524.	5.0	9.7	16.	11.
1	255.	1254.	284.	2559.	4.4	9.0	28.	11.
1	347.	1178.	267.	2404.	4.4	9.0	27.	11.
6	347.	4693.	681.	6901.	6.9	10.1	68.	11.
3	347.	937.	186.	1801.	5.0	9.7	19.	11.
1	405.	208.	47.	424.	4.4	9.0	5.	11.
6	434.	556.	79.	817.	7.1	10.4	8.	11.
3	460.	476.	94.	915.	5.0	9.7	9.	11.
1	517.	44.	10.	90.	4.4	9.0	1.	11.
3	566.	490.	97.	942.	5.0	9.7	10.	11.
1	628.	48.	10.	90.	4.4	9.0	1.	11.
3	636.	879.	174.	1691.	5.0	9.7	17.	11.
3	779.	303.	60.	582.	5.0	9.7	6.	11.

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TABLE B-5

04/16/74 13.23.23

1980 ANNUAL TRAFFIC STATISTICS

SERVICE CLASS TRIPS/DAY MIN MAX	PASSENGERS (MILL)	SEATS (MILL)	TRIPS (MILL)	RPM (BILL)	SEAT-MILES (BILL)	TRIP-MILES (BILL)	PAX / TRIP	SEAT/ TRIP	R-BAR SEATS (STATUTE MILES)	R-BAR TRIPS	AIRPORT PAIRS	MIN. TRIPS (MILL)
1.4 - 61.4	33.361	68.083	6.887	6.460	13.184	1.137	5.7	11.6	194.	165.	902.	0.689
6.7 - 68.5	19.434	39.262	3.989	2.971	6.002	0.539	5.5	11.1	153.	135.	613.	0.399
9.0 - 43.6	9.308	17.899	2.007	1.897	3.648	0.334	5.7	10.9	204.	167.	343.	0.201
1.4 - 23.6	9.026	18.882	1.675	1.859	3.889	0.302	6.2	12.9	206.	180.	322.	0.168
8.6 - 29.3	11.842	24.166	2.676	1.991	4.063	0.408	4.9	9.9	168.	153.	433.	0.268
5.0 - 80.3	16.720	24.588	1.199	4.120	6.058	0.289	14.2	20.9	246.	241.	119.	0.120
TOTAL	5.0 - 61.4	99.689	192.880	18.433	19.297	36.843	3.010	6.4	191.	163.	2732.	1.843

AVERAGE TRAFFIC GROWTH RATES FROM 1972 BASE YEAR IN PERCENT/YEAR

0.0 0.0 0.0

RANGE CLASS / NUMBER OF ELEMENTS --- 58/ 0 -- 48/ 0 -- 35/ 0 -- 24/ 0 -- 16/ 0 -- 0/175

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B.3 FINAL MEDIUM DENSITY NETWORK

The final medium density network is described by a series of three tables. Table B-6 details the information by airport pair, airline code (as listed in the Official Airline Guide (OAG)), and by type of equipment used on routes between each airport pair. In Table B-6, RW is Hughes Airwest and Equipment F-27 is the F-27 Turboprop Aircraft. The arrangement of the data generally follows the format in Table B-2 in Section B.2 preceding. Table B-7, Summary of Route Data by Model Number - 1974 is comparable to Table B-3 in the previous section. The total model is represented partially by data from elements 51 to 100 as shown in Table B-8. The format is slightly different from the tabulated information representative of the initial traffic network. Minimum and maximum trips are equal to schedules from 1974 data.

TABLE B-6
ROUTE DATA BY EQUIPMENT TYPE F27 1974
EQUIPMENT TYPE F27

RANGE CLASS	TRIPS/DAY	SEATS/DAY	SEATS/TRIP	SEAT-MILES	TRIP-MILES	RANGE	BAR	RCLASS	SCLASS	NRP	TIME/TRIP	FUEL (LBS.)
RW	LWS	-	PUW	35.00	1400.	26	1	1				
RW	EAT	-	EPH	21.00	840.	34	1	1				
RW	ALW	-	PSC	21.00	840.	41	1	1				
1- 50	11.00	440.	40.	14200.	355.	32	10001.	1	3	1.05	5460.	
RW	IDA	-	PIH	28.00	1120.	51	1	1				
RW	LAX	-	PMD	24.00	960.	52	1	1				
RW	ACV	-	CEC	24.00	960.	55	1	1				
RW	IPL	-	YUM	14.00	560.	58	1	2				
RW	SCK	-	SMF	12.00	480.	60	1	1				
RW	ALW	-	LWS	7.00	280.	65	1	1				
RW	SCK	-	SFO	18.00	720.	65	1	1				
RW	SFO	-	STS	16.00	720.	66	1	1				
RW	SMF	-	STS	12.00	480.	67	1	1				
RW	ALW	-	PUW	21.00	840.	73	1	1				
RW	AST	-	PDX	12.00	480.	74	1	1				
RW	EPH	-	PSC	7.00	280.	75	1	1				
RW	GCN	-	PGA	10.00	400.	76	1	1				
RW	SFO	-	SMF	14.00	560.	86	1	1				
RW	EAT	-	SEA	21.00	840.	99	1	1				
51- 100	34.57	1583.	40.	92309.	2308.	66	10001.	1	15	1.31	27703.	
RW	SEA	-	YKM	7.00	280.	103	1	1				
RW	BLH	-	PSP	12.00	480.	105	1	1				
RW	CDC	-	PGA	10.00	400.	106	1	1				
RW	LAX	-	PSP	26.00	1040.	110	1	1				
RW	ALW	-	YKM	7.00	280.	113	1	1				
RW	GCN	-	IGM	10.00	400.	113	1	1				
RW	CEC	-	OTH	24.00	960.	115	1	1				
RW	AST	-	SEA	12.00	480.	116	1	1				
RW	COC	-	GCN	2.00	80.	132	1	1				
RW	EPH	-	LWS	14.00	560.	135	1	1				
101- 150	17.71	709.	40.	80731.	2018.	113	10001.	1	10	1.77	20876.	
RW	BLH	-	PHX	12.00	480.	157	1	1				
RW	PHX	-	YUM	14.00	560.	161	1	1				
RW	IGM	-	PHX	16.00	400.	168	1	2				
RW	OTH	-	FLX	24.00	960.	171	1	1				
RW	GCN	-	PHX	2.00	80.	175	1	1				
RW	IPL	-	LAX	14.00	560.	181	1	1				
RW	BOI	-	PIH	28.00	1120.	189	1	1				
151- 200	14.86	594.	40.	103417.	2585.	174	10001.	1	7	2.90	23576.	
RW	BOI	-	IDA	24.00	960.	209	1	1				
RW	CDC	-	SLC	10.60	400.	222	1	1				
201- 300	4.86	194.	40.	41349.	1034.	212	10001.	1	2	3.45	8949.	
TOTALS		83.00	3320.	40.	332006.	8300.	100		27	1.79	86563.	

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TABLE B-7
SUMMARY OF ROUTE DATA BY MODEL NUMBER 1974

EQUIPMENT F27

ELEMENT NO.	EQUIPT	RANGE	SEATS/DAY FRACTION	TRIPS/DAY FRACTION	SEAT-MILES FRACTION	TRIP-MILES FRACTION	RANGE CLASS	SERVICE CLASS	AIRPORT PAIRS
82	F27	32.	440.0 *****#**#**#11.00000000	11.0 0.000007496	14200. 0.000025290	355. 0.000164399	10001.	1	3
83	F27	66.	1382.9 *****#**#**#34.57142639	34.6 0.00048727	92309. 0.000164399	2208. 0.000164399	10001.	1	15
84	F27	113.	708.6 *****#**#**#17.71427917	17.7 0.00042616	80731. 0.000143781	2018. 0.000143781	10001.	1	16
85	F27	174.	594.3 *****#**#**#14.85714245	14.9 0.00054591	103417. 0.000184183	2585. 0.000184183	10001.	1	7
86	F27	212.	194.3 *****#**#**# 4.85714245	4.9 0.00021827	41349. 0.000073641	1034. 0.000073641	10001.	1	2
EQUIPMENT TOTALS		3320.	83.	332006.	8300.				
		0.000113825	0.00238711	0.000175257	0.000591293				37

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TABLE B-8
DETAIL OF MODEL DATA BY ELEMENT NUMBER 1974

ID	RANGE	PAX	MXTRIP	SEATS	SERV	NCP	PCCLASS	MNTRIP
51	444.	684.	21.	1683.	1	146039	10001.	21.
52	547.	690.	17.	1315.	1	137666	20001.	17.
53	627.	485.	12.	924.	1	106494	20001.	12.
54	772.	349.	8.	664.	1	86926	20001.	8.
55	851.	170.	4.	324.	1	47003	20001.	4.
56	29.	1658.	184.	3157.	2	28890	10001.	184.
57	31.	765.	82.	1456.	1	12786	10001.	82.
58	68.	1708.	176.	3253.	1	51725	10001.	176.
59	74.	1136.	127.	2164.	2	29620	10001.	127.
60	117.	780.	84.	1466.	2	36529	10001.	84.
61	122.	563.	58.	1072.	1	27407	10001.	58.
62	151.	50.	6.	95.	1	3130	10001.	6.
63	172.	9.	1.	17.	2	495	10001.	1.
64	231.	110.	12.	210.	2	8620	10001.	12.
65	41.	1015.	19.	1932.	1	39930	10001.	19.
66	77.	6405.	124.	12200.	1	315829	10001.	124.
67	122.	7411.	142.	14117.	1	479095	10001.	142.
68	178.	3724.	71.	7043.	1	296491	10001.	71.
69	249.	8866.	169.	16887.	1	871509	10001.	169.
70	343.	3995.	76.	7614.	1	494744	10001.	76.
71	456.	2451.	47.	4669.	1	363791	10001.	47.
72	543.	1400.	27.	2666.	1	231835	20001.	27.
73	667.	1056.	20.	2012.	1	204703	20001.	20.
74	783.	168.	2.	206.	1	23146	20001.	2.
75	834.	267.	5.	569.	1	59933	20001.	5.
76	40.	528.	23.	1006.	1	10685	10001.	23.
77	76.	3415.	148.	6566.	1	112066	10001.	148.
78	125.	1831.	79.	3489.	1	93344	10001.	79.
79	174.	752.	33.	1433.	1	47687	10001.	33.
80	240.	284.	12.	541.	1	23516	10001.	12.
81	356.	86.	4.	163.	1	10198	10001.	4.
82	32.	231.	11.	440.	1	5460	10001.	11.
83	66.	726.	35.	1383.	1	27702	10001.	35.
84	113.	372.	18.	709.	1	20875	10001.	18.
85	174.	312.	15.	554.	1	23575	10001.	15.
86	212.	102.	5.	194.	1	8948	10001.	5.
87	54.	94.	11.	178.	1	1814	10001.	11.
88	38.	390.	19.	743.	1	8313	10001.	19.
89	78.	1002.	48.	1909.	1	34217	10001.	48.
90	138.	285.	14.	543.	1	15114	10001.	14.
91	178.	249.	12.	474.	1	16537	10001.	12.
92	210.	18.	1.	34.	1	1337	10001.	1.
93	27.	235.	17.	453.	1	3664	10001.	17.
94	138.	19.	1.	37.	1	924	10001.	1.
95	196.	94.	7.	178.	1	6721	10001.	7.
96	44.	126.	13.	239.	2	1861	10001.	13.
97	65.	254.	27.	483.	2	4635	10001.	27.
98	119.	454.	48.	864.	2	15154	10001.	48.
99	163.	143.	15.	273.	2	5258	10001.	15.
100	234.	100.	11.	190.	2	4965	10001.	11.

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B.4 OPERATIONAL SIMULATION INPUT AND OUTPUT STATISTICS

Some basic characteristics of conceptual aircraft are shown in Tables B-9 and B-10. These characteristics are partially input and output from the Design/Cost/DOC module of the Performance Evaluation Technique used for operational simulation. In Table B-9, characteristics of seven aircraft are listed. The ID numbers refer to the following tabulations:

<u>ID</u>	<u>Seats</u>	<u>Field Length (Ft/M)</u>	<u>Range (N.Mi/Km)</u>
5311	50	4,500 (1372)	775 (1435)
5111	50	4,500	563 (1042)
5211	50	4,500	337 (624)
3011	30	4,500	566 (1048)
7011	70	4,500	562 (1041)
5411	50	3,500 (1066)	564 (1044)
5611	50	5,500 (1676)	565 (1046)

Weight and performance data generally are input with program and operating costs as output.

Table B-10 presents the DOC functions of the same conceptual aircraft. The cost data is presented at one-tenth increments of design range. The Cost per Trip (actual) is the cost at each range increment computed by the Dougals DOC cost formula discussed in Section 13.1. The Cost per Trip (calculated) is the actual function fitted to a straight line representative of the initial points. It is this line function which is presented in the equation for \$/Trip. A similar curve fit is made to represent the Block Time function with the equations shown.

Table B-11 lists input and output cost characteristics for five aircraft used in the final network competitive evaluation. The ID numbers are consistent with the seating capacities of 30 to 70. Data blanks or zeros (0) represent computations in the Design segment of the program module. For these aircraft, that segment was bypassed.

Table B-12 lists DOC data and functions derived and presented in the same manner as in Table B-10.

TABLE B-9
DATA INPUT AND PRELIMINARY COST CHARACTERISTICS FOR SEVERAL CONCEPTUAL AIRCRAFT

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PRODUCT ID	5311	5111	5211	3011	7011	5411	5611
INTRODUCTION DATE	1980	1980	1980	1980	1980	1980	1980
CRUISE MACH NUMBER	0.700	0.685	0.685	0.650	0.700	0.650	0.710
DESIGN RANGE (N.MI)	775.	563.	337.	566.	562.	564.	565.
DESIGN PAYLOAD (NO. SEATS)	50.	50.	50.	30.	70.	50.	50.
INITIAL CRUISE ALTITUDE (FT)	25000.	25000.	25000.	22000.	24000.	22000.	24000.
TAKE-OFF FIELD LENGTH (FT)							
LANDING FIELD LENGTH (FT)							
NO. OF ENGINES	2.	2.	2.	2.	2.	2.	2.
ENGINE TYPE	HIBYPASS						
OPERATING PURPOSE	DOMESTIC						
NO. OF FLIGHT CREW	2.	2.	2.	2.	2.	2.	2.
BREAK-POINT CAPACITY (SEATS)							
BREAK-POINT RANGE (N.MI)							
RANGE AT ZERO PAYLOAD (N.MI)							
GROSS WEIGHT (LBS)	46600.	43920.	41340.	32080.	56730.	48150.	42220.
LANDING WEIGHT (LBS)	40510.	39050.	37706.	28211.	50850.	42840.	37430.
ZERO FUEL WEIGHT (LBS)	37960.	37040.	36180.	26590.	48380.	40650.	39460.
OPERATOR WEIGHT EMPTY (LBS)	27960.	27040.	26180.	20590.	34380.	30650.	25460.
MANUFACTURER WEIGHT EMPTY (LBS)	26964.	26050.	25197.	19673.	33153.	29631.	24487.
AIRFRAME WEIGHT (LBS)	23706.	22980.	22309.	17431.	29187.	26937.	21421.
CAPACITY FUEL (LBS)	13270.	12422.	11517.	8581.	17015.	21437.	8579.
WING AREA (SQ.FT)	528.	497.	468.	363.	642.	746.	374.
TAKE-OFF THRUST PER ENGINE (LB)	8470.	7980.	7510.	5830.	10310.	8410.	7970.
FUEL CONSUMPTION (LBS/HR)	2698.	2849.	3395.	2152.	3504.	2951.	2889.
PRODUCTION RATE PER MONTH	8.	8.	8.	8.	8.	8.	8.
BREAK EVEN UNIT	400.	400.	400.	400.	400.	400.	400.
NEW DEVELOPMENT FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PRICE TO COST RATIO	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
DEVELOPMENT COST (\$ MILLION)	118.589	111.261	105.765	82.756	139.808	114.104	112.089
UNIT PRICE (\$ MILLION)	3.299	3.125	2.982	2.409	3.847	3.256	3.105
ENGINES PRICE (\$ MILLION)	0.662	0.631	0.601	0.493	0.780	0.658	0.630
OPERATIONAL LOAD FACTR	0.500	0.500	0.500	0.500	0.500	0.500	0.500
ANNUAL UTILIZATION (HRS)	3682.	3453.	3113.	3494.	3439.	3495.	3429.
DOLLARS PER FLIGHT	898.52	692.10	463.88	628.83	770.93	748.58	670.87
DOLLARS PER N.MILE	1.16	1.23	1.38	1.11	1.37	1.33	1.19
CENTS PER SEAT-N.MILE	2.319	2.459	2.753	3.703	1.960	2.655	2.375
BLOCK TIME (HRS)	2.257	1.709	1.071	1.798	1.678	1.800	1.658

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TABLE B-10
DIRECT OPERATING COST AT DECIMAL VARIATIONS OF DESIGN RANGE - INITIAL CONCEPTUAL AIRCRAFT

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AIRCRAFT 5311 DIRECT OPERATING COST

RANGE	(N. MILES)	77.50	155.00	232.50	310.00	387.50	465.00	542.50	620.00	697.50	775.00
*** ATA DIRECT OPERATING COST ***											
$\$/\text{TRIP} = (92.154) + (1.040) * \text{RANGE}$											
\$ / TRIP (ACTUAL)	167.08	251.99	335.28	417.37	498.56	579.06	659.04	738.61	817.86	891.72	
\$ / TRIP (CALCULATED)	172.79	253.43	334.06	410.70	495.34	575.97	656.61	737.25	817.88	898.52	
\$ / HOUR (CALCULATED)	510.89	459.61	436.93	424.14	415.92	410.20	405.99	402.76	400.21	398.13	
\$ / N. MILE (CALCULATED)	2.23	1.64	1.44	1.34	1.28	1.24	1.21	1.19	1.17	1.16	
CENT/SEAT=N.MI. (CALCULATED)	4.459	3.270	2.874	2.675	2.557	2.477	2.421	2.378	2.345	2.319	
*** ATA DDC LESS DEPRICATION ***											
$\$/\text{TRIP} = (71.782) + (0.898) * \text{RANGE}$											
\$ / TRIP (ACTUAL)	140.02	210.38	280.52	350.50	420.36	490.12	559.81	629.45	699.04	764.07	
\$ / TRIP (CALCULATED)	141.35	210.93	280.50	350.07	419.64	489.22	558.79	628.36	697.93	767.50	
\$ / HOUR (CALCULATED)	417.94	382.53	366.87	358.03	352.36	348.42	345.51	343.28	341.51	340.08	
\$ / N. MILE (CALCULATED)	1.82	1.36	1.21	1.13	1.08	1.05	1.03	1.01	1.00	0.99	
CENT/SEAT=N.MI. (CALCULATED)	3.648	2.722	2.413	2.259	2.166	2.104	2.060	2.027	2.001	1.981	
*** BLOCK TIME ***											
$TB = (0.12504) + (0.00275) * \text{RANGE}$											
BLOCK TIME (ACTUAL=HRS)	0.34	0.55	0.76	0.98	1.19	1.41	1.62	1.83	2.05	2.25	
BLOCK TIME ((CALCULATED)=HRS)	0.34	0.55	0.76	0.98	1.19	1.40	1.62	1.83	2.04	2.26	

AIRCRAFT 5111 DIRECT OPERATING COST

RANGE	(N. MILES)	56.30	112.60	168.90	225.20	281.50	337.80	394.10	450.40	506.70	563.00
*** ATA DIRECT OPERATING COST ***											
$\$/\text{TRIP} = (85.573) + (1.077) * \text{RANGE}$											
\$ / TRIP (ACTUAL)	142.76	206.09	268.43	329.98	390.90	451.31	511.31	570.97	630.35	689.50	
\$ / TRIP (CALCULATED)	146.23	206.88	267.53	328.18	388.83	449.49	510.14	570.79	631.44	692.10	
\$ / HOUR (CALCULATED)	522.53	471.61	447.76	433.93	424.90	418.54	413.82	410.17	407.28	404.92	
\$ / N. MILE (CALCULATED)	2.60	1.84	1.58	1.46	1.38	1.33	1.29	1.27	1.25	1.23	
CENT/SEAT=N.MI. (CALCULATED)	5.194	3.675	3.168	2.915	2.763	2.661	2.589	2.535	2.492	2.459	
*** ATA DDC LESS DEPRICATION ***											
$\$/\text{TRIP} = (69.236) + (0.928) * \text{RANGE}$											
\$ / TRIP (ACTUAL)	121.03	173.66	226.15	278.54	330.84	383.07	435.25	487.38	539.47	591.53	
\$ / TRIP (CALCULATED)	121.50	173.77	226.03	278.30	330.56	382.83	435.09	487.36	539.62	591.89	
\$ / HOUR (CALCULATED)	434.18	396.13	378.30	367.97	361.22	356.47	352.94	350.22	348.05	346.29	
\$ / N. MILE (CALCULATED)	2.16	1.54	1.34	1.24	1.17	1.13	1.10	1.08	1.06	1.05	
CENT/SEAT=N.MI. (CALCULATED)	4.316	3.086	2.677	2.472	2.349	2.267	2.208	2.164	2.130	2.103	
*** BLOCK TIME ***											
$TB = (0.12102) + (0.00282) * \text{RANGE}$											
BLOCK TIME (ACTUAL=HRS)	0.28	0.44	0.60	0.76	0.92	1.07	1.23	1.39	1.55	1.71	
BLOCK TIME ((CALCULATED)=HRS)	0.28	0.44	0.60	0.76	0.92	1.07	1.23	1.39	1.55	1.71	

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AIRCRAFT 5211 DIRECT OPERATING COST

RANGE	(N. MILES)	33,70	67,40	101,10	134,80	168,50	202,20	235,90	269,60	303,30	337,00
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*** ATA DIRECT OPERATING COST ***
 $\$/TRIP = (81.725) + (1.134) * RANGE$

\$ / TRIP	(ACTUAL)	118.22	157.70	196.76	235.47	273.87	312.01	349.90	387.60	425.10	462.45
\$ / TRIP	(CALCULATED)	119.94	158.16	196.37	230.59	272.80	311.02	349.23	387.45	425.66	463.88
\$ / HOUR	(CALCULATED)	558.11	510.23	484.82	469.07	458.36	450.59	444.71	440.09	436.38	433.33
\$ / N. MILE	(CALCULATED)	3.56	2.35	1.94	1.74	1.62	1.54	1.48	1.44	1.40	1.38
CENT/SEAT=N.MI.	(CALCULATED)	7,118	4,693	3,885	3,481	3,238	3,076	2,961	2,874	2,807	2,753

*** ATA DUC LESS DEPRICIATION ***
 $\$/TRIP = (69.343) + (0.974) * RANGE$

\$ / TRIP	(ACTUAL)	101.94	134.95	167.90	200.81	233.67	266.49	299.28	332.05	364.79	397.50
\$ / TRIP	(CALCULATED)	102.18	135.01	167.85	200.69	233.52	266.36	299.19	332.03	364.86	397.70
\$ / HOUR	(CALCULATED)	475.46	435.57	414.40	401.29	392.36	385.89	380.99	377.14	374.05	371.51
\$ / N. MILE	(CALCULATED)	3.03	2.00	1.66	1.49	1.39	1.32	1.27	1.23	1.20	1.18
CENT/SEAT=N.MI.	(CALCULATED)	6,064	4,006	3,320	2,978	2,772	2,635	2,537	2,463	2,406	2,360

*** BLOCK TIME ***
 $TB = (0.11984) + (0.00282) * RANGE$

BLOCK TIME	(ACTUAL=HRS)	0.21	0.31	0.41	0.50	0.60	0.69	0.79	0.88	0.98	1.07
BLOCK TIME	((CALCULATED=HRS))	0.21	0.31	0.41	0.50	0.60	0.69	0.79	0.88	0.98	1.07

AIRCRAFT 3011 DIRECT OPERATING COST

RANGE	(N. MILES)	56,60	113,20	169,80	226,40	283,00	339,60	396,20	452,80	509,40	566,00
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*** ATA DIRECT OPERATING COST ***
 $\$/TRIP = (71.233) + (0.985) * RANGE$

\$ / TRIP	(ACTUAL)	124.12	182.12	239.27	295.76	351.73	407.29	462.50	517.45	572.17	626.71
\$ / TRIP	(CALCULATED)	126.99	182.75	238.51	294.27	350.03	405.79	461.55	517.31	573.07	628.83
\$ / HOUR	(CALCULATED)	447.47	404.26	384.49	373.16	365.81	360.66	356.85	353.92	351.60	349.70
\$ / N. MILE	(CALCULATED)	2.24	1.61	1.40	1.30	1.24	1.19	1.16	1.14	1.12	1.11
CENT/SEAT=N.MI.	(CALCULATED)	7,479	5,381	4,682	4,333	4,123	3,983	3,883	3,808	3,750	3,703

*** ATA DUC LESS DEPRICIATION ***
 $\$/TRIP = (58.555) + (0.866) * RANGE$

\$ / TRIP	(ACTUAL)	107.16	156.45	205.64	254.73	303.75	352.71	401.63	450.51	499.36	548.19
\$ / TRIP	(CALCULATED)	107.55	156.54	205.53	254.53	303.52	352.51	401.50	450.50	499.49	548.48
\$ / HOUR	(CALCULATED)	378.96	346.28	331.33	322.76	317.20	313.31	310.43	308.21	306.45	305.02
\$ / N. MILE	(CALCULATED)	1.90	1.38	1.21	1.12	1.07	1.04	1.01	0.99	0.98	0.97
CENT/SEAT=N.MI.	(CALCULATED)	6,334	4,610	4,035	3,787	3,575	3,460	3,378	3,316	3,268	3,230

*** BLOCK TIME ***
 $TB = (0.11554) + (0.00297) * RANGE$

BLOCK TIME	(ACTUAL=HRS)	0.28	0.45	0.62	0.79	0.96	1.13	1.29	1.46	1.63	1.80
BLOCK TIME	((CALCULATED=HRS))	0.28	0.45	0.62	0.79	0.96	1.13	1.29	1.46	1.63	1.80

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AIRCRAFT 7011 DIRECT OPERATING COST

RANGE	(N. MILES)	56,20	112,40	168,60	224,80	281,00	337,20	393,40	449,60	505,80	562,00
*** ATA DIRECT OPERATING COST ***											
\$ / TRIP	(ACTUAL)	163,64	233,83	302,86	370,95	438,30	505,04	571,28	637,11	702,61	767,82
\$ / TRIP	(CALCULATED)	167,76	234,78	301,80	368,81	435,83	502,85	569,87	636,89	703,91	770,93
\$ / HOUR	(CALCULATED)	594,98	537,13	509,59	493,48	482,91	475,44	469,88	465,58	462,16	459,37
\$ / N. MILE	(CALCULATED)	2,99	2,09	1,79	1,64	1,55	1,49	1,45	1,42	1,39	1,37
CENT/SEAT=N.MI.	(CALCULATED)	4,264	2,984	2,557	2,344	2,216	2,130	2,069	2,024	1,988	1,960
*** ATA DOC LESS DEPRICINATION ***											
\$ / TRIP	(ACTUAL)	136,71	194,04	251,21	308,26	365,20	422,06	478,85	535,59	592,28	648,93
\$ / TRIP	(CALCULATED)	137,27	194,17	251,07	307,97	364,86	421,76	478,66	535,55	592,45	649,35
\$ / HOUR	(CALCULATED)	486,86	444,23	423,93	412,06	404,27	398,77	394,67	391,80	388,98	386,93
\$ / N. MILE	(CALCULATED)	2,44	1,73	1,49	1,37	1,30	1,25	1,22	1,19	1,17	1,16
CENT/SEAT=N.MI.	(CALCULATED)	3,489	2,468	2,127	1,957	1,855	1,787	1,738	1,702	1,673	1,651
*** BLOCK TIME ***											
BLOCK TIME	(ACTUAL=HRS)	0,28	0,44	0,59	0,75	0,90	1,06	1,21	1,37	1,52	1,68
BLOCK TIME	((CALCULATED=HRS))	0,28	0,44	0,59	0,75	0,90	1,06	1,21	1,37	1,52	1,68

AIRCRAFT 5411 DIRECT OPERATING COST

RANGE	(N. MILES)	56,40	112,80	169,20	225,60	282,00	338,40	394,80	451,20	507,60	564,00
*** ATA DIRECT OPERATING COST ***											
\$ / TRIP	(ACTUAL)	151,86	220,71	288,44	355,30	421,46	487,06	552,21	617,01	681,50	745,75
\$ / TRIP	(CALCULATED)	155,68	221,56	287,44	353,31	419,19	485,07	550,94	616,82	682,70	748,58
\$ / HOUR	(CALCULATED)	535,69	483,45	459,19	445,19	436,07	429,65	424,90	421,24	418,32	415,96
\$ / N. MILE	(CALCULATED)	2,76	1,96	1,70	1,57	1,49	1,43	1,40	1,37	1,34	1,33
CENT/SEAT=N.MI.	(CALCULATED)	5,521	3,928	3,398	3,132	2,973	2,867	2,791	2,734	2,690	2,655
*** ATA DOC LESS DEPRICINATION ***											
\$ / TRIP	(ACTUAL)	128,43	185,62	242,65	299,56	356,37	413,11	469,79	526,42	583,01	639,57
\$ / TRIP	(CALCULATED)	128,95	185,73	242,51	299,29	356,06	412,84	469,62	526,40	583,17	639,95
\$ / HOUR	(CALCULATED)	443,72	405,27	387,42	377,11	370,40	365,68	362,18	359,48	357,34	355,60
\$ / N. MILE	(CALCULATED)	2,29	1,65	1,43	1,33	1,26	1,22	1,19	1,17	1,15	1,13
CENT/SEAT=N.MI.	(CALCULATED)	4,573	3,293	2,867	2,653	2,525	2,440	2,379	2,333	2,298	2,269
*** BLOCK TIME ***											
BLOCK TIME	(ACTUAL=HRS)	0,29	0,46	0,63	0,79	0,96	1,13	1,30	1,46	1,63	1,80
BLOCK TIME	((CALCULATED=HRS))	0,29	0,46	0,63	0,79	0,96	1,13	1,30	1,46	1,63	1,80

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AIRCRAFT 5611 DIRECT OPERATING COST

RANGE	(N. MILES)	56,50	113,00	169,50	226,00	282,50	339,00	395,50	452,00	508,50	565,00
*** ATA DIRECT OPERATING COST ***											
\$ / TRIP	(ACTUAL)	139,85	201,04	261,29	320,79	379,69	438,10	496,11	553,79	611,19	668,37
\$ / TRIP	(CALCULATED)	143,17	201,80	260,44	319,07	377,70	436,34	494,97	553,60	612,24	670,87
\$ / HOUR	(CALCULATED)	522,49	471,74	447,82	435,91	424,81	418,40	413,63	409,95	407,02	404,63
\$ / N. MILE	(CALCULATED)	2,53	1,79	1,54	1,41	1,34	1,29	1,25	1,22	1,20	1,19
CENT/SEAT=N.MI.	(CALCULATED)	5,068	3,572	3,073	2,824	2,674	2,574	2,503	2,450	2,408	2,375
*** ATA DOC LESS DEPRICIATION ***											
\$ / TRIP	(ACTUAL)	118,67	169,52	220,24	270,86	321,40	371,87	422,29	472,66	522,99	573,29
\$ / TRIP	(CALCULATED)	119,12	169,62	220,12	270,63	321,13	371,63	422,13	472,63	523,13	573,63
\$ / HOUR	(CALCULATED)	434,72	396,51	378,51	368,03	361,18	356,35	352,76	349,99	347,78	345,99
\$ / N. MILE	(CALCULATED)	2,11	1,50	1,30	1,20	1,14	1,10	1,07	1,05	1,03	1,02
CENT/SEAT=N.MI.	(CALCULATED)	4,217	3,002	2,597	2,395	2,273	2,192	2,135	2,091	2,058	2,031
*** BLOCK TIME ***											
BLOCK TIME	(ACTUAL=HRS)	0,27	0,43	0,58	0,74	0,89	1,04	1,20	1,35	1,50	1,66
BLOCK TIME	((CALCULATED=HRS))	0,27	0,43	0,58	0,74	0,89	1,04	1,20	1,35	1,50	1,66

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TABLE B-11
FINAL DESIGN BASEPOINT AND DERIVATIVE AIRCRAFT CHARACTERISTICS

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PRODUCT ID	3212	4212	5212	6212	7212
INTRODUCTION DATE	1980	1980	1980	1980	1980
CRUISE MACH NUMBER	0.750	0.750	0.750	0.750	0.750
DESIGN RANGE (N.MI)	850.	850.	850.	850.	850.
DESIGN PAYLOAD (NO. SEATS)	30.	40.	50.	60.	70.
INITIAL CRUISE ALTITUDE (FT)	0.	0.	0.	0.	0.
TAKE-OFF FIELD LENGTH (FT)	0.	0.	0.	0.	0.
LANDING FIELD LENGTH (FT)	0.	0.	0.	0.	0.
NO. OF ENGINES	2.	2.	2.	2.	2.
ENGINE TYPE	HIBYPASS	HIBYPASS	HIBYPASS	HIBYPASS	HIBYPASS
OPERATING PURPOSE	DOMESTIC	DOMESTIC	DOMESTIC	DOMESTIC	DOMESTIC
NO. OF FLIGHT CREW	2.	2.	2.	2.	2.
BREAK-POINT CAPACITY (SEATS)	0.	0.	0.	0.	0.
BREAK-POINT RANGE (N.MI)	0.	0.	0.	0.	0.
RANGE AT ZERO PAYLOAD (N.MI)	0.	0.	0.	0.	0.
GROSS WEIGHT (LBS)	34370.	40597.	46850.	53560.	60306.
LANDING WEIGHT (LBS)	29003.	34533.	40090.	46104.	52147.
ZERO FUEL WEIGHT (LBS)	27125.	32429.	37760.	43508.	49283.
OPERATOR WEIGHT EMPTY (LBS)	21125.	24429.	27760.	31508.	35283.
MANUFACTURER WEIGHT EMPTY (LBS)	20147.	23429.	26685.	30314.	33943.
AIRFRAME WEIGHT (LBS)	17687.	20514.	23315.	0.	29589.
CAPACITY FUEL (LBS)	0.	0.	0.	0.	0.
WING AREA (SQ.FT)	339.	402.	464.	532.	600.
TAKE-OFF THRUST PER ENGINE(LB)	6402.	7586.	8770.	10050.	11331.
FUEL CONSUMPTION (LBS/HR)	2333.	2633.	2932.	3229.	3529.
PRODUCTION RATE PER MONTH	0.	0.	8.	0.	0.
BREAK EVEN UNIT	0.	0.	400.	0.	0.
NEW DEVELOPMENT FACTOR	1.00	1.00	1.00	1.00	1.00
PRICE TO COST RATIO	0.0	0.0	1.0000	0.0	0.0
DEVELOPMENT COST (\$ MILLION)	80.873	94.786	122.042	122.614	136.527
UNIT PRICE (\$ MILLION)	2.372	2.726	3.077	3.585	3.788
ENGINES PRICE (\$ MILLION)	0.532	0.606	0.682	0.762	0.842
OPERATIONAL LOAD FACTOR	0.0	0.0	0.500	0.0	0.0
ANNUAL UTILIZATION (HRS)	2945.	2945.	2946.	2947.	2948.
DOLLARS PER FLIGHT	834.72	896.74	958.60	959.94	1086.01
DOLLARS PER N.MILE	0.98	1.05	1.13	1.13	1.28
CENTS PER SEAT-N.MILE	3.273	2.637	2.256	1.882	1.825
BLOCK TIME (HRS)	2.300	2.303	2.306	2.309	2.312

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TABLE B-12
DIRECT OPERATING COSTS OF BASEPOINT AND DERIVATIVE AIRCRAFT

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AIRCRAFT 3212 DIRECT OPERATING COST

RANGE	(N. MILES)	85,00	170,00	255,00	340,00	425,00	510,00	595,00	680,00	765,00	850,00
*** ATA DIRECT OPERATING COST ***											
\$ / TRIP	(ACTUAL)	145.52	224.30	302.42	379.92	456.84	533.21	609.07	684.45	759.39	827.45
\$ / TRIP	(CALCULATED)	149.79	225.90	302.00	378.10	454.20	530.31	606.41	682.51	758.62	834.72
\$ / HOUR	(CALCULATED)	442.68	406.04	390.03	381.05	375.30	371.31	368.38	366.13	364.35	362.91
\$ / N. MILE	(CALCULATED)	1.76	1.33	1.18	1.11	1.07	1.04	1.02	1.00	0.99	0.98
CENT/SEAT=N.MI.	(CALCULATED)	5.874	4.429	3.948	3.707	3.562	3.466	3.397	3.346	3.306	3.273
*** ATA DOC LESS DEPRICATION ***											
\$ / TRIP	(ACTUAL)	124.77	190.81	256.75	322.62	388.40	454.11	519.74	585.32	650.83	710.61
\$ / TRIP	(CALCULATED)	126.05	191.46	256.87	322.28	387.69	453.10	518.51	583.92	649.33	714.74
\$ / HOUR	(CALCULATED)	372.52	344.14	331.74	324.79	320.34	317.25	314.98	313.24	311.86	310.75
\$ / N. MILE	(CALCULATED)	1.48	1.13	1.01	0.95	0.91	0.89	0.87	0.86	0.85	0.84
CENT/SEAT=N.MI.	(CALCULATED)	4.943	3.754	3.358	3.160	3.041	2.961	2.905	2.862	2.829	2.803
*** BLOCK TIME ***											
TB = (0.12041) + (0.00256) * RANGE											
BLOCK TIME	(ACTUAL=HRS)	0.34	0.55	0.77	0.99	1.21	1.43	1.65	1.87	2.09	2.29
BLOCK TIME	((CALCULATED=HRS))	0.34	0.56	0.77	0.99	1.21	1.43	1.65	1.86	2.08	2.30

AIRCRAFT 4212 DIRECT OPERATING COST

RANGE	(N. MILES)	85,00	170,00	255,00	340,00	425,00	510,00	595,00	680,00	765,00	850,00
*** ATA DIRECT OPERATING COST ***											
\$ / TRIP	(ACTUAL)	157.86	242.48	326.32	409.46	491.93	573.77	655.02	735.73	815.92	888.72
\$ / TRIP	(CALCULATED)	162.70	244.26	325.82	407.38	488.94	570.50	652.06	733.62	815.18	896.74
\$ / HOUR	(CALCULATED)	476.76	436.78	419.23	409.36	403.04	398.65	395.42	392.94	390.98	389.39
\$ / N. MILE	(CALCULATED)	1.91	1.44	1.28	1.20	1.15	1.12	1.10	1.08	1.07	1.05
CENT/SEAT=N.MI.	(CALCULATED)	4.785	3.592	3.194	2.995	2.876	2.797	2.740	2.697	2.664	2.637
*** ATA DOC LESS DEPRICATION ***											
\$ / TRIP	(ACTUAL)	133.82	203.79	273.66	343.43	413.11	482.70	552.21	621.65	691.02	754.31
\$ / TRIP	(CALCULATED)	135.22	204.50	273.78	343.05	412.33	481.61	550.89	620.16	689.44	758.72
\$ / HOUR	(CALCULATED)	396.23	365.68	352.26	344.72	339.89	336.53	334.06	332.17	330.67	329.46
\$ / N. MILE	(CALCULATED)	1.59	1.20	1.07	1.01	0.97	0.94	0.93	0.91	0.90	0.89
CENT/SEAT=N.MI.	(CALCULATED)	3.977	3.007	2.684	2.522	2.425	2.361	2.315	2.280	2.253	2.232
*** BLOCK TIME ***											
TB = (0.12340) + (0.00256) * RANGE											
BLOCK TIME	(ACTUAL=HRS)	0.34	0.56	0.78	1.00	1.21	1.43	1.65	1.87	2.09	2.29
BLOCK TIME	((CALCULATED=HRS))	0.34	0.56	0.78	1.00	1.21	1.43	1.65	1.87	2.08	2.30

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AIRCRAFT 5212 DIRECT OPERATING COST

RANGE	(N. MILES)	85,00	170,00	255,00	340,00	425,00	510,00	595,00	680,00	765,00	850,00
*** ATA DIRECT OPERATING COST ***											
\$ / TRIP	(ACTUAL)	170.26	260.68	350.23	438.97	526.97	614.26	700.88	786.89	872.31	949.84
\$ / TRIP	(CALCULATED)	175.65	262.65	349.64	436.64	523.63	610.63	697.62	784.62	871.61	938.60
\$ / HOUR	(CALCULATED)	510.43	467.27	448.23	437.50	430.62	425.83	422.31	419.61	417.47	415.73
\$ / N. MILE	(CALCULATED)	2.07	1.54	1.37	1.28	1.23	1.20	1.17	1.15	1.14	1.13
CENT/SEAT=N.MI.	(CALCULATED)	4.133	3.090	2.742	2.568	2.464	2.395	2.345	2.308	2.279	2.256
*** ATA DOC LESS DEPRICITATION ***											
\$ / TRIP	(ACTUAL)	142.91	216.80	290.58	364.25	437.82	511.29	584.67	657.96	731.18	797.98
\$ / TRIP	(CALCULATED)	144.42	217.56	290.70	363.83	436.97	510.11	583.25	656.39	729.53	802.67
\$ / HOUR	(CALCULATED)	419.66	387.05	372.66	364.55	359.36	355.74	353.07	351.03	349.42	348.11
\$ / N. MILE	(CALCULATED)	1.70	1.28	1.14	1.07	1.03	1.00	0.98	0.97	0.95	0.94
CENT/SEAT=N.MI.	(CALCULATED)	3.398	2.559	2.280	2.140	2.056	2.000	1.961	1.931	1.907	1.889
*** BLOCK TIME ***											
BLOCK TIME	(ACTUAL=HRS)	0.34	0.56	0.78	1.00	1.22	1.44	1.66	1.87	2.09	2.29
BLOCK TIME	((CALCULATED=HRS))	0.34	0.56	0.78	1.00	1.22	1.43	1.65	1.87	2.09	2.31

AIRCRAFT 6212 DIRECT OPERATING COST

RANGE	(N. MILES)	85,00	170,00	255,00	340,00	425,00	510,00	595,00	680,00	765,00	850,00
*** ATA DIRECT OPERATING COST ***											
\$ / TRIP	(ACTUAL)	172.63	263.34	353.05	441.83	529.72	616.80	703.11	788.69	873.59	950.57
\$ / TRIP	(CALCULATED)	178.72	265.53	352.33	439.13	525.93	612.73	699.53	786.34	873.14	959.94
\$ / HOUR	(CALCULATED)	514.81	469.85	449.92	438.67	431.44	426.40	422.69	419.85	417.59	415.77
\$ / N. MILE	(CALCULATED)	2.10	1.56	1.38	1.29	1.24	1.20	1.18	1.16	1.14	1.13
CENT/SEAT=N.MI.	(CALCULATED)	3.504	2.603	2.303	2.153	2.062	2.002	1.959	1.927	1.902	1.882
*** ATA DOC LESS DEPRICITATION ***											
\$ / TRIP	(ACTUAL)	140.49	211.97	283.31	354.53	425.62	496.61	567.49	638.27	708.96	773.44
\$ / TRIP	(CALCULATED)	142.06	212.73	283.40	354.07	424.73	495.40	566.07	636.74	707.41	778.07
\$ / HOUR	(CALCULATED)	409.21	376.43	361.90	353.69	348.42	344.75	342.05	339.97	338.33	337.00
\$ / N. MILE	(CALCULATED)	1.67	1.25	1.11	1.04	1.00	0.97	0.95	0.94	0.92	0.92
CENT/SEAT=N.MI.	(CALCULATED)	2.786	2.086	1.852	1.736	1.666	1.619	1.586	1.561	1.541	1.526
*** BLOCK TIME ***											
BLOCK TIME	(ACTUAL=HRS)	0.34	0.56	0.78	1.00	1.22	1.44	1.66	1.88	2.10	2.30
BLOCK TIME	((CALCULATED=HRS))	0.35	0.57	0.78	1.00	1.22	1.44	1.65	1.87	2.09	2.31

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AIRCRAFT 7212 DIRECT OPERATING COST

RANGE	(IN MILES)	85,00	170,00	255,00	340,00	425,00	510,00	595,00	680,00	765,00	850,00
*** ATA DIRECT OPERATING COST ***											
S / TRIP	(ACTUAL)	196,13	298,44	399,69	499,96	599,30	697,77	795,43	892,33	988,51	1075,75
S / TRIP	(CALCULATED)	202,64	300,79	398,95	497,10	595,25	693,40	791,56	889,71	987,86	1086,01
S / HOUR	(CALCULATED)	578,69	529,44	507,50	495,09	487,10	481,53	477,43	474,28	471,78	469,76
S / N. MILE	(CALCULATED)	2,38	1,77	1,56	1,46	1,40	1,36	1,33	1,31	1,29	1,28
CENT/SEAT-N.MI.	(CALCULATED)	3,406	2,528	2,235	2,089	2,001	1,942	1,900	1,869	1,845	1,825
*** ATA DOC LESS DEPRICATION ***											
S / TRIP	(ACTUAL)	161,88	243,88	325,74	407,46	489,06	570,54	651,92	733,18	814,35	888,40
S / TRIP	(CALCULATED)	163,62	244,74	325,85	406,97	488,08	569,20	650,31	731,43	812,54	893,66
S / HOUR	(CALCULATED)	467,25	430,77	414,51	405,32	399,40	395,28	392,24	389,90	388,06	386,56
S / N. MILE	(CALCULATED)	1,92	1,44	1,28	1,20	1,15	1,12	1,09	1,08	1,06	1,05
CENT/SEAT-N.MI.	(CALCULATED)	2,750	2,057	1,825	1,710	1,641	1,594	1,561	1,537	1,517	1,502
*** BLOCK TIME ***											
BLOCK TIME	(ACTUAL-HRS)	0,35	0,57	0,79	1,00	1,22	1,44	1,66	1,88	2,10	2,30
BLOCK TIME	((CALCULATED-HRS))	0,35	0,57	0,79	1,00	1,22	1,44	1,66	1,88	2,09	2,31

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B.5 NONCOMPETITIVE OPERATIONAL SIMULATION WITH CONCEPTUAL AIRCRAFT

Table B -13 is a sample of printout from the computerized operational simulation model. This model was used to evaluate performance of all of the initial parametric and conceptual variations of the initial aircraft. Shown in the table are the 1980 Annual Traffic Statistics divided into the six regions. These are labeled in the first part of the table as Service Class. The minimum trip per day is the 1972 schedule used as a base in this part of the study. Other pertinent data are Passengers (demand for seats per route), RPM, R-Bar (the average stage length in each traffic region) and minimum trips in millions, which is the annual total in the mission model.

The 1980 fleet characteristics are shown in the next two lines of data. These data are output from the simulation program. There is some overlap in data which is of no consequence in the analysis, i.e., Number of Units, Revenue Passenger Miles, and Average Range.

TABLE B-13

MISSION MODEL DEMAND AND FLEET STATISTICS

06/06/74 20.43.27

BD 119, RR 50, CS 0, PC 2,

1980 ANNUAL TRAFFIC STATISTICS

SERVICE CLASS TRIPS/DAY MIN MAX	PASSENGERS (MILL)	SEATS (MILL)	TRIPS (MILL)	KPM (MILL)	SEAT-MILES (BILL)	TRIP-MILES (BILL)	PAX / TRIP	SEAT/ TRIP	R-BAR SEATS (STATUTE MILES)	R-BAR TRIPS PAIRS (MILES)	AIRPORT TRIPS PAIRS	MIN. TRIPS (MILL)
1.4 - 61.4	30.417	62.075	6.512	5.622	11.474	1.037	5.4	11.1	185.	159.	902.	0.651
6.7 - 68.5	16.994	38.571	3.873	2.945	5.950	0.532	5.5	11.2	155.	137.	615.	0.387
9.0 - 45.6	5.308	17.699	2.007	1.897	3.048	0.334	5.7	10.9	204.	167.	343.	0.201
1.4 - 23.6	9.026	16.882	1.675	1.659	3.889	0.302	6.2	12.9	206.	180.	322.	0.168
8.6 - 28.3	11.475	22.418	2.613	1.911	3.901	0.395	4.6	9.9	167.	151.	433.	0.261
4.9 - 25.0	5.816	6.556	0.482	1.334	1.962	0.138	12.4	18.2	229.	223.	111.	0.048
TOTAL	4.4 - 61.4	85.036	169.201	17.162	15.562	30.622	2.718	5.7	182.	158.	2724.	1.716

06/06/74 20.43.27

BD 119, RR 50, CS 0, PC 2, PAGE 14

1980

MAXIMUM PROFIT FLEET CHARACTERISTICS SUMMARY

ID	TRIPS (MILL)	TRIP-MILES (MILL)	REVENUE DOLLARS	BLOCK SPEED (MPH)	NO. OF UNITS	UTILIZATION (HRS/AC/YR)	FUEL MIL-TONS	REVENUE FAX-MILES	SEAT-MILES (BILL)	LOAD FACTOR	AVE RANGE	PRODUCTIVITY KPM/AC MIL
5111	5.414	592.5	1864462.0	317.8	656.	2842.	2.656	14.697	29.624	0.490	175.	22.40
TOTAL	5.414	592.5	1864462.0	317.8	656.	2842.	2.656	14.697	29.624	0.490	175.	22.40

SUMMARY REPORT BASED ON MAXIMUM PROFIT

CANDIDATE TRANSPORT	TRANSPORT FLEET UNITS	FLEET PCNT	PRICE \$MIL, PCNT	ANNUAL REVENUE \$MIL, PCNT	ANNUAL PROFIT \$MIL, PCNT	RETURN ON INVEST	PASSENGER-MILES MIL, PCNT	PASSENGERS THN'D, PCNT	RANGE BAR			
5111	656.10	100.0	2050.607	100.0	2090.828	100.0	31.766	100.0	1.55	14697. 100.0	83851. 100.0	175.
TOTAL	656.10	100.0	2050.607	100.0	2090.828	100.0	31.766	100.0	1.55	14697. 100.0	83851. 100.0	

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B.6 COMPETITIVE OPERATIONAL SIMULATION

The competitive evaluation of contemporary and medium density derivative aircraft was conducted with a revised network and mission model. Data representative of this analysis are shown in the following three tables for 1980, 1985, and 1990. Table B-14 lists the 1980 traffic statistics from the mission model and summaries of fleet statistics. The mission model has two parts or service classes. Service Class 1 is that major portion of the model which has growth rates associated with the RPM demanded. Service Class 2 is the zero growth network equivalent to commuter or low density traffic. The fleet composition which provides the requisite trips and RPM is shown in the next two series of data. The aircraft ID identifies the aircraft and the performance it generates. The aircraft are identified as follows:

3212	30 seat Basepoint Derivative
4212	40 seat Basepoint Derivative
5212	50 seat Basepoint
6212	60 seat Basepoint Derivative
9016	B737/DC-9 type

Detailed and summary fleet statistics are listed for the fleet and each aircraft.

Tables B-15 and B-16 are the same as the table for 1980, but show fleet data for 1985 and 1990 respectively.

TABLE B-14
1980 MISSION MODEL DEMAND AND FLEET STATISTICS

12/17/74 13.16.55

1980 ANNUAL TRAFFIC STATISTICS

SERVICE CLASS	PASSENGERS (MILL)	SEATS (MILL)	TRIPS (MILL)	RPM (BILL)	SEAT-MILES (BILL)	TRIP-MILES (BILL)	PAX / TRIP	SEAT/ TRIP	R-BAR SEATS (STATUTE MILES)	R-BAR TRIPS	LOAD FACTOR	MIN. TRIPS (MILL)
1	70,474	134,236	22,614	12.997	24,755	0.250	52.0	99.0	184.	157,	52.50	1,594
2	3,535	5,894	3,439	0.310	0,517	0.031	10.2	16.9	88.	89,	59.98	0,344
TOTAL	74,009	140,130	26,054	13.307	25,272	0.281	47.4	90.1	180.	145,	52.65	1,938

1980

MAXIMUM PROFIT FLEET CHARACTERISTICS SUMMARY

ID	TRIPS (MIL)	TRIP-MILES (MILL)	REVENUE HOURS	BLOCK SPEED (MPH)	NO.OF UNITS	UTILIZATION (HRS/AC/YR)	FUEL MIL-TONS	REVENUE PAX-MILES	SEAT-MILES (BILL)	LOAD FACTOR	AVE RANGE	PRODUCTIVITY RPM/AC MIL
3212	0.579	49.7	180221.5	275.9	91.	1978.	0.210	0,544	1,492	0.365	85,	5.97
4212	0.030	2.5	9329.6	271.3	5.	1995.	0.012	0,049	0,101	0.484	84,	10.48
6212	0.233	24.7	84984.7	290.4	42.	2008.	0.137	0,738	1,481	0.498	106,	17.43
9016	1.310	252.6	797246.3	316.9	299.	2666.	2.471	11,976	25,265	0.474	200,	40.05
TOTAL	2,152	329.6	1071782.0	307.5	437.	2452.	2.831	13,307	28,339	0.470	180,	30.44

SUMMARY REPORT BASED ON MAXIMUM PROFIT

CANDIDATE TRANSPORT	TRANSPORT UNITS	FLEET PCNT	PRICE SMIL,PCNT	ANNUAL REVENUE SMIL,PCNT	ANNUAL PROFIT SMIL,PCNT	RETURN ON INVEST	PASSENGER-MILES MIL,PCNT	PASSENGERS THNND,PCNT	RANGE BAR
3212	91.12	20.8	216,143	10.8	95,122	6.2	-41,339	-36.2	-19,13
4212	4,68	1.1	12,750	0.6	8,588	0.6	-0,940	-0.8	-7,37
6212	42.33	9.7	151,755	7.6	113,487	7.4	-4,515	-4.0	-2,98
9016	299.00	68.4	1614,600	80.9	1315,707	85.8	151,855	133.1	9,41
TOTAL	437.13	100.0	1995,248	100.0	1532,903	100.0	114,091	100.0	5,72
							13307,	100.0	74009,

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TABLE B-15
1985 MISSION MODEL DEMAND AND FLEET STATISTICS

12/17/74 13.16.55

1985 ANNUAL TRAFFIC STATISTICS

SERVICE CLASS	PASSENGERS (MILL)	SEATS (MILL)	TRIPS (MILL)	RPM (BILL)	SEAT-MILES (BILL)	TRIP-MILES (BILL)	PAX / TRIP	SEAT/ TRIP	R-BAR SEATS (STATUTE MILES)	R-BAR TRIPS	LOAD FACTOR	MIN. TRIPS (MILL)
1	89,944	171,323	28,862	16.587	31,595	0,250	66.3	126.4	184,	157,	52.50	1,594
2	3,535	5,894	3,439	0,310	0,517	0,031	10.2	16.9	88,	89,	59.98	0,344
TOTAL	93,479	177,216	32,302	16.897	32,112	0,281	60.2	114.4	181,	145,	52.62	1,938

1985

MAXIMUM PROFIT FLEET CHARACTERISTICS SUMMARY

ID	TRIPS (MIL)	TRIP-MILES (MIL)	REVENUE HOURS	BLOCK SPEED (MPH)	NO. OF UNITS	UTILIZATION (HRS/AC/YR)	FUEL MIL-TONS	REVENUE PAX-MILES	SEAT-MILES (BILL)	LOAD FACTOR	AVE RANGE	PRODUCTIVITY RPM/AC MIL
3212	0.463	41.9	148840.4	281.2	75.	1986.	0.174	0.471	1,256	0.375	90,	6.28
4212	0.115	7.9	31800.1	248.4	16.	1943.	0.042	0.138	0,316	0.436	69,	8.42
5212	0.030	2.5	9415.5	268.8	5.	1996.	0.014	0.063	0.127	0.494	84,	13.26
9016	1.779	332.0	1059269.0	313.5	404.	2622.	3.284	16,226	33,204	0.489	190,	40.16
TOTAL	2,388	384.3	1249325.0	307.6	500.	2498.	3.513	16,897	34,902	0.484	181,	33.79

SUMMARY REPORT BASED ON MAXIMUM PROFIT

CANDIDATE TRANSPORT	TRANSPORT UNITS	FLEET PCNT	PRICE \$MIL,PCNT	ANNUAL REVENUE \$MIL,PCNT	ANNUAL PROFIT \$MIL,PCNT	RETURN ON INVEST	PASSENGER-MILES MIL,PCNT	PASSENGERS THND,PCNT	RANGE BAR						
3212	74.95	15.0	177,793	7.4	79,313	4.1	-33,365	-17.1	-18,77	471,	2.8	5227,	5.6	90,	
4212	16.37	3.3	44,617	1.8	27,428	1.4	-4,436	-2.3	-9,94	138,	0.8	2006,	2.1	69,	
5212	4.72	0.9	14,515	0.6	10,961	0.6	-0,308	-0.2	-2,12	63,	0.4	742,	0.8	84,	
9016	404.00	80.8	2181,600	90.2	1824,044	93.9	233,649	119.5	10,71	16226,	96.0	85503,	91.5	190,	
TOTAL	500.04	100.0	2418,524	100.0	1941,746	100.0	195,540	100.0	8.09	16897,	100.0	.93478,	100.0		

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TABLE B-16

1990 MISSION MODEL DEMAND AND FLEET STATISTICS

12/17/74 13,16,55

1990 ANNUAL TRAFFIC STATISTICS

SERVICE CLASS	PASSENGERS (MILL)	SEATS (MILL)	TRIPS (MILL)	RPM (BILL)	SEAT-MILES (BILL)	TRIP-MILES (BILL)	PAX / TRIP	SEAT/ TRIP	R-BAR SEATS (STATUTE MILES)	R-BAR TRIPS (STATUTE MILES)	LOAD FACTOR	MIN. TRIPS (MILL)
1	112,618	214,510	36,138	20,768	39,559	0,250	83.1	158.2	184.	157,	52.50	1,594
2	3,535	5,894	3,439	0,310	0,517	0,031	10.2	16.9	88.	89,	59.98	0,344
TOTAL	116,152	220,404	39,577	21,079	40,076	0,281	75.1	142.8	182.	145,	52.60	1,938

1990

MAXIMUM PROFIT FLEET CHARACTERISTICS SUMMARY

ID	TRIPS (MIL)	TRIP-MILES (MILL)	REVENUE HOURS	BLOCK SPEED (MPH)	NO. OF UNITS	UTILIZATION (HRS/AC/YR)	FUEL MIL-TONS	REVENUE PAX-MILES	SEAT-MILES (BILL)	LOAD FACTOR	AVE RANGE	PRODUCTIVITY RPM/AC MIL
3212	0.345	30.6	109618.9	279.3	55.	1985.	0.128	0.310	0.919	0.338	88.	5.62
4212	0.150	12.2	45568.2	267.5	23.	1974.	0.060	0.221	0.488	0.453	80.	9.56
5212	0.086	7.0	26312.3	265.1	13.	1959.	0.039	0.153	0.349	0.438	81.	11.38
6212	0.031	2.6	9805.2	266.2	5.	1997.	0.016	0.078	0.157	0.500	84.	15.95
9016	2.147	406.9	1291472.0	315.1	521.	2479.	4.004	20.317	40,691	0.499	190.	39.00
TOTAL	2,758	450.3	1482776.0	309.8	618.	2401.	4.246	21.079	42,603	0.495	181.	34.13

SUMMARY REPORT BASED ON MAXIMUM PROFIT

CANDIDATE TRANSPORT	TRANSPORT UNITS	FLEET PCNT	FLEET \$MIL,PCNT	PRICE \$MIL,PCNT	ANNUAL REVENUE \$MIL,PCNT	ANNUAL PROFIT \$MIL,PCNT	RETURN ON INVEST	PASSENGER-MILES MIL,PCNT	PASSENGERS THNDED,PCNT	RANGE BAR		
3212	55.22	8.9	130,987	4.3	53,063	2.2	-26,938	-9.8	-20.57	3535.	3.0	88.
4212	23.08	3.7	62,928	2.1	39,845	1.6	-5,582	-2.0	-8.87	2751.	2.4	80.
5212	13.43	2.2	41,331	1.3	27,364	1.1	-2,298	-0.8	-5.56	1879.	1.6	81.
6212	4.91	0.8	17,599	0.6	13,724	0.6	-0,624	-0.2	-3.54	929.	0.8	84.
9016	521.00	84.4	2813,400	91.8	2283,858	94.5	310,041	112.4	11,02	20317.	96.4	190.
TOTAL	617.65	100.0	3066,244	100.0	2417,854	100.0	275,846	100.0	9,00	21079.	100.0	116151.

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B-7 REGIONAL AIRPORT SURVEY

The Reuben H. Donnelly Corporation provides Official Airlines Guide (OAG) data on airline scheduled service. Table B-17 show a portion of data sheets generated by a machine processing and sorting routine applied to an August 1973 OAG data tape. The sheets included are sample sheets of a total survey of world airlines and airports. Only those sheets are shown which include regional carriers contained in the initial network used in the parametric and conceptual aircraft analysis. These airlines are identified as:

XK - Air California
AL - Allegheny Airlines
FL - Frontier Airlines
RW - Hughes Air West
NC - North Central Airlines
OZ - Ozark Airlines
PS - Pacific Southwest Airlines
PI - Piedmont Aviation
SO - Southern Airways
TT - Texas International Airlines

Table B-18 contains the regional airline airports for which detailed statistical data were available for the year 1972. These data were from Federal Aviation Administration (FAA) sources.

Table B-19 presents data on runway lengths of length corrected for altitude and hot days. The correction is based on a simple FAA correction method which accounts for degradation in field length performance by an

average commercial jet aircraft. The correction accounts for altitude above sea level and for the highest temperature above 59°F expected to occur with a prediction reliability of 85 percent.

Runway Length Correction

The corrected runway lengths were computed by dividing the actual length by the product of the elevation correction factor, gradient correction factor, and temperature correction factor.

a. Elevation Correction Factor

$$F_e = (0.07 \times E + 1)$$

Where E = Airport elevation in thousands of feet

b. Temperature Correction Factor

$$F_t = 0.005 [T - (59 - 3.566E)] + 1$$

Where T = Normal maximum temperature in degrees Fahrenheit.

c. Gradient Correction Factor

$$F_g = (0.1 \times G + 1)$$

Where G = % Effective Gradient

$$\text{Corrected Runway Length} = \frac{\text{Runway Length}}{F_e \times F_t \times F_g}$$

TABLE B-17

AIRLINES SERVING THE WORLD'S AIRPORTS
LISTED ALPHABETICALLY BY AIRLINE NAME
1 AUGUST 1973

PAGE 8

28	TY	AIR CALEDONIE				
13	IHO	TOUHO, NEW CALEDONIA				
29	XK	AIR CALIFORNIA-INTRA-STATE				
1	OAK	OAKLAND, CALIF., USA	2	ONT	ONTARIO, CALIF., USA	
3	PSP	PALM SPRINGS, CALIF., USA	4	SAC	SACRAMENTO, CALIF., USA	
5	SAN	SAN DIEGO, CALIF., USA	6	SFO	SAN FRANCISCO, CALIF., USA	
7	SJC	SAN JOSE, CALIF., USA	8	SNA	SANTA ANA, CALIF., USA	
30	HC	AIR CAMBODGE				
1	BKK	BANGKOK, THAILAND	2	NAJ	BATTAMBANG, KHMER REP.	
3	HKG	HONG KONG, BR CROWN COLONY	4	WBF	KUMFONG SUM, KHMER REP.	
5	WDT	ODDOR MEANCHEY, KHMER REP.	6	PAI	PAILIN, KHMER REP.	
7	PNH	PHNOM PENH, KHMER REPUBLIC	8	SGN	S'IGON, S VIETNAM	
9	SIN	SINGAPORE, SINGAPORE				
31	AC	AIR CANADA				
1	AVU	ANTIGUA, WEST INDIES	2	BGI	BARBADOS, WEST INDIES	
3	BDA	BERMUDA, ATLANTIC OCEAN	4	BOS	BOSTON, MASS., USA	
5	BRU	BRUSSELS, BELGIUM	6	YYC	CALGARY, ALTA., CANADA	
7	ORD	CHICAGO, ILLINOIS ARPT, USA	8	CLE	CLEVELAND, OHIO, USA	
9	CPH	COPENHAGEN, DENMARK	10	YXR	EARLTON, ONT.	
11	YEG	EDMONTON, ALTA-INT APT, CANADA	12	FRA	FRANKFURT, GERMANY	
13	YFC	FREDERICTON, N.B.	14	FPO	FREEPORT, BAHAMAS	
15	YQX	GANDER, NFLD., CANADA	16	PIK	GLASGOW, SCOT-PRESTWICK ARPT.	
17	YHZ	HALIFAX, NOVA SCOTIA	18	KIN	KINGSTON, JAMAICA	
19	CHE	LONDON, ENGLAND-HEATHROW ARPT	20	YAU	LONDON, ONT.	
21	LAX	LOS ANGELES, CALIF., USA	22	MIA	MIAMI, FLA., USA	
23	YDN	MUNICH, N.B.	24	MBJ	MONTIGO BAY, JAMAICA	
25	YUL	MONTREAL, QUE., CANADA	26	SYD	MOSCOW, USSR-SHEREMEYEVO ARPT	
27	NAS	NASSAU, BAHAMAS	28	JFK	NEW YORK, NY-KENNEDY INT ARPT, USA	
29	YVB	NORTH BAY, ONT.	30	YON	OTTAWA, ONTARIO, CANADA	
31	YRY	PARIS, FRANCE-ORLY ARPT	32	POS	PORT OF SPAIN, TRINIDAD	
33	PRG	PRAGUE, CZECHOSLOVAKIA	34	YQB	QUEBEC, QUE.	
35	YDR	REGINA, SASK.	36	YUY	ROUYN - NIORTANIA, QUE.	
37	YSS	SAINT JOHN, N.B.	38	YXE	SASKATOON, SASK.	
39	YAM	SAULT STE MARIE, ONT.	40	YZV	SEVEN ISLANDS, QUE.	
41	SMN	SHANNON, IRELAND	42	YI	ST. JOHN, NFLD.	
43	VJL	STEPHENVILLE, NFLD.	44	YSD	SUDBURY, ONT.	
45	YQY	SYDNEY, N.S.	46	TPA	TAMPA, FLA., USA	
47	YOT	THUNDER BAY, ONT.	48	YIS	TIMMINS, ONT.	
49	YYZ	TORONTO, ONT., CANADA	50	YVO	VAL D'OR, QUE.	
51	YVR	VANCOUVER, B.C., CANADA	52	YYJ	VICTORIA, B.C.	
53	VIE	VIEENNA, AUSTRIA	54	YQR	WINDSOR, ONT., CANADA	
55	YWG	WINNIPEG, MAN., CANADA	56	YAI	YARMOUTH, N.S.	
57	ZRH	ZURICH, SWITZERLAND				
32	UJ	AIR CENTRE				
1	CFE	CLERMONT-FERRAND, FRANCE	2	LPY	LE PUY, FRANCE	

AIRLINES SERVING THE WORLD'S AIRPORTS
LISTED ALPHABETICALLY BY AIRLINE NAME
OAG AUGUST 1973

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85	NH	ALL NIPPON		
21	OIT	OITA, JAPAN	22	OKJ OKAYAMA, JAPAN
23	OKA	OKINAWA, RYUKYU IS., JAPAN	24	OMJ OMURA, JAPAN
25	OSA	OSAKA, JAPAN	26	OSH OSHIMA IS., JAPAN
27	CTS	SAPPORO, JAPAN-CHITOSE ARPT.	28	SOJ SENJUJ, JAPAN
29	IAK	TAKAMATSU, JAPAN	30	HND TOKYO, JAPAN-HANEDA AIRPORT
31	TTJ	TOTTORI, JAPAN	32	TOY TOYAMA, JAPAN
33	UBJ	UBE, JAPAN	34	GAJ YAMAGATA, HONSHU, JAPAN
35	YGJ	YUNAGU, JAPAN		
86	AL	ALLEGHENY AIRLINES		
1	CAC	ACKRON/CANTON, OHIO, USA	2	ALB ALBANY, N.Y., USA
3	ABE	ALLENTOWN, PA., USA	4	AOU ALTOONA, PA., USA
5	ATY	ATLANTIC CITY, N.J., USA	6	BAL BALTIMORE, MD., USA
7	BGM	BINGHAMTON, N.Y., USA	8	BIG BLOOMINGTON, IND., USA
9	BOS	BOSTON, MASS., USA	10	BFD BRADFORD, PA., USA
11	BDR	BRIDGEPORT, CONN., USA	12	BUF BUFFALO, N.Y., USA
13	BIV	BURLINGTON, VT., USA	14	CAW CAPE MAY, N.J., USA
15	CRW	CHARLESTON, W. VA., USA	16	CHN CHICAGO, ILL-MIDNAY ARPT, USA.
17	CRD	CHICAGO, ILL-O'HARE ARPT, USA.	18	CVG CINCINNATI, OHIO, USA
19	CRB	CLARKSBURG, W. VA., USA	20	CLE CLEVELAND, OHIO, USA
21	CMH	COLUMBUS, OHIO, USA	22	DNV DANVILLE, ILL., USA
23	DAY	DAYTON, OHIO, USA.	24	DTR DETROIT, MICH-METROPOLITAN APT, USA
25	DUJ	DU BOIS, PA., USA	26	ERW ELKINS, W. VA., USA
27	ELM	ELMIRA, N.Y., USA	28	ERI ERIE, PA., USA
29	EVV	EVANSVILLE, IND., USA	30	FKL FRANKLIN, PA., USA
31	GFL	GLEN FALLS, N.Y., USA	32	GRR GRAND RAPIDS, MICH., USA
33	HGR	HAGERSTOWN, MD., USA	34	MDT HARRISBURG, PA-INTERNATIONAL ARPT.
35	BDL	HARTFORD, CONN., USA	36	HZL HAZLETON, PA., USA
37	HTS	HUNTINGTON, W. VA., USA	38	IND INDIANAPOLIS, IND., USA
39	ISP	ISLIP, N.Y., USA	40	ITH ITHACA, N.Y., USA
41	JHN	JAMESTOWN, N.Y., USA	42	JST JOHNSTOWN, PA., USA
43	EEN	KEENE, N.H., USA	44	LAF LAFAYETTE, IND., USA
45	LNS	LANCASTER, PA., USA	46	LEX LEXINGTON, KY., USA
47	LIA	LIMA, OHIO, USA	48	SDF LOUISVILLE, KY., USA
49	MFD	MANSFIELD, OHIO, USA	50	MSS MASSENA, N.Y., USA
51	MEM	MEMPHIS, TENN., USA	52	MSP MINNEAPOLIS/ST PAUL, MINN, USA
53	YUL	MONTRAL, QUE., CANADA	54	MGN MORGANTOWN, W. VA., USA
55	MIE	MUNCIE, IND., USA	56	BNA NASHVILLE, TENN., USA
57	HVN	NEW HAVEN, CONN., USA.	58	GON NEW LONDON, CONN., USA
59	JFK	NEW YORK, NY-KENNEDY INT ARPT, USA	60	LGA NEW YORK, NY-LA GUARDA ARPT., USA
61	EWR	NEW YORK, NY-NEWARK ARPT, USA	62	PHF NEWPORT NEWS, VA., USA
63	ORF	NORFOLK, VA., USA	64	DGS OGDENSBURG, N.Y., USA
65	PKB	PARKERSBURG, W. VA., USA	66	PHC PHILADELPHIA, PA., USA
67	FNE	PHILADELPHIA, PA-NE ARPT, USA	68	PSB PHILIPSBURG, PA., USA
69	PIT	PITTSBURGH, PA., USA	70	PLB PLATTSBURGH, N.Y., USA
71	PVD	PROVIDENCE, R.I., USA	72	HBN HENDERSON, PA., USA
73	ROC	ROCHESTER, N.Y., USA.	74	HUI RUTLAND, VT., USA
75	SBY	SALISBURY, MD., USA	76	SLK SARANAC LAKE, N.Y., USA

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AIRLINES SERVING THE WORLD'S AIRPORTS
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86	AL	ALLEGHENY AIRLINES		
77	SBN	SOUTH BEND, IND., USA	78	STL ST. LOUIS, MO., USA
79	SYR	SYRACUSE, N.Y., USA	80	HUF TERRE HAUTE, IND., USA
81	TOI	TOLEDO, OHIO, USA	82	YYZ TORONTO, ONT., CANADA
83	TTN	TRENTON, N.J., USA	84	UCA UTICA, N.Y., USA
85	DCA	WASHINGTON, DC-NATIONAL ARPT., USA	86	ART WATERDOWN, N.Y., USA
87	HPN	WHITE PLAINS, N.Y., USA	88	AVP WILKES-BARRE/SCRANTON, PA., USA
89	JPT	WILLIAMSPORT, PA., USA	90	TLG WILMINGTON, DEL., USA
91	UHH	WORCESTER, MASS., USA	92	YNG YOUNGSTOWN, OHIO, USA
87	VJ	ALLEN AVIATION, INC.		
1	MCI	KANSAS CITY, MO., USA	2	LNC LAWRENCE, KAN., USA
3	MHK	MANHATTAN, KAN., USA	4	TOP TOPEKA, KAN., USA
88	TS	ALASKA AIRLINES		
1	ZTO	HILO, HAWAII; HAWAII, USA	2	HNL HONOLULU, OAHU; HAWAII, USA
3	OGR	KAHULUI, MAUI; HAWAII, USA	4	MKK KAUNAKAKAI, MAUIKAI; HAW., USA
5	KUA	KONA, HAWAII; HAWAII, USA	6	LTH LIHUE, KAUAII; HAWAII, USA
89	AK	ALTAIR AIRLINES INC-AIR-TAXI		
1	ALB	ALBANY, N.Y., USA	7	BBC BELLEVILLE, PA., USA
3	BAL	BALTIMORE, MD., USA	4	BBB BRIDGEPORT, CONN., USA
5	POT	HARRISBURG, PA-INTERNATIONAL ARPT.	6	BBL HARTFORD, CONN., USA
7	ISP	ISLIP, N.Y., USA	8	PHL PHILADELPHIA, PA., USA
9	RIC	RICHMOND, VA., USA	10	DCA WASHINGTON, DC-NATIONAL ARPT., USA
11	HPN	WHITE PLAINS, N.Y., USA	12	AVP WILKES-BARRE/SCRANTON, PA., USA
13	JPT	WILLIAMSPORT, PA., USA	14	TLG WILMINGTON, DEL., USA
90	DY	ALYEMDA, DEMOCRATIC YEMEN AIRLINES		
1	ADE	ADEN, DEM. REP. OF YEMEN	2	RAY AL GHAYDAH, DEM. REP. OF YEMEN
3	AKX	ATAQ, DEM. REP. OF YEMEN	4	BHN BEITAN, DEM. REP. OF YEMEN
5	BEY	BEIRUT, LEBANON	6	BRO BURAO, SOMALI REP.
7	CAT	CAIRO, ARAB REP OF EGYPT	8	JTB DJIBOUTI, FR TERR AIRRS & ISSRS
9	GXF	GHURAF, DEM. REP. OF YEMEN	10	HGA HARGEISA, SOMALI REP
11	KWI	KUWAIT, KUWAIT	12	MEK MAFRA, DEM. REP. OF YEMEN
13	MGU	MOGADISHU, SOMALI REP.	14	USD USHN, S. ARABIA
15	RIY	RIYAN, DEM. REP. OF YEMEN	16	TAT TAIZ, YEMEN ARAB REPUBLIC
91	AA	AMERICAN AIRLINES		
1	ACA	ACAPULCO, MEXICO	2	ALB ALBANY, N.Y., USA
3	AUA	ARUBA, NETH. ANTILLES	4	AKL AUCKLAND, NEW ZEALAND
5	BAL	BALTIMORE, MD., USA	6	BJS BOSTON, MASS., USA
7	BUF	BUFFALO, N.Y., USA	8	CRW CHARLESTON, W. VA., USA
9	MUN	CHICAGO, ILL-MIDWAY ARPT., USA	10	ORD CHICAGO, ILL-O'HARE ARPT., USA
11	CVG	CINCINNATI, OHIO, USA	12	CLE CLEVELAND, OHIO, USA
13	CPI	COLUMBUS, OHIO, USA	14	CUR CURACAO, NETH. ANTILLES
15	DAL	DALLAS/FT. WORTH, TEXAS, USA	16	DAY DAYTON, OHIO, USA
17	DTW	DETROIT, MICH-METROPOLITAN API, USA	18	ELF EL PASO, TEXAS, USA
19	BUL	HARTFORD, CONN., USA	20	HNL HONOLULU, OAHU; HAWAII, USA

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193	FI	FLUGFELAG-ICELANDAIR		10	IEI	ISAFJORDUR, ICELAND
.9	HZK	HUSAVIK, ICELAND		12	UAK	NARSSAASSUAN, GREENLAND
11	LHR	LONDON, ENGLAND-HEATHROW AIRP.		14	OSL	OSLO, NORWAY
13	NOR	NORDFJORDUR, ICELAND		16	RBN	RANIFARHDEN, ICELAND
15	PFI	PATHERSEFJORDUR, ICELAND		18	REK	REYKJAVIK, ICELAND
17	KEF	REYKJAVIK, ICE. KEFLAVIK AIRP.		20	THD	THORSHOFN, ICELAND
19	SAK	SAUDARKHOKUR, ICELAND		22	VEY	VESTMANNAYJAR, ICELAND
21	VAG	VAGAAR IS, FAEFDE IS, DENMARK				
194	FL	FRONTIER AIRLINES		2	ALS	ALAMOSA, COLO., USA
1	ALM	ALAMOGORDO, N.M., USA		4	AIA	ALLIANCE, NEBR., USA
3	ABQ	ALBUQUERQUE, N.M., USA		6	BVO	BARTLESVILLE, OKLA., USA
5	AMA	AMARILLO, TEXAS, USA		8	BIS	BISMARCK, N.D., USA
7	BIL	BILLINGS, MONT., USA		10	CPR	CASPER, WYO., USA
9	BZN	BOZEMAN, MONT., USA		12	CYS	CHEYENNE, WYO., USA
11	CDR	CHAURON, NEBR., USA		14	COS	COLORADO SPRINGS, COLO., USA
13	COD	CODY, WYO., USA		16	CEZ	CORTEZ, COLO., USA
15	COL	COLUMBUS, NEBR., USA		18	DEN	DENVER, COLO., USA
17	DAL	DALLAS/FT. WORTH, TEXAS, USA		20	ELP	EL PASO, TEXAS, USA
19	DRO	DURANGO, COLO., USA		22	FHN	FORT WORTH, N.M., USA
21	EDW	EWING, OKLA., USA		24	FLG	FLAGSTAFF, ARIZ., USA
23	FYV	FAYETTEVILLE, ARK., USA		26	FSM	FT. SMITH, ARK., USA
25	TBN	FT. LEONARD WOOD, MO., USA		28	GCR	GRANGE CITY, KAN., USA
27	GUP	GULFOP, N.M., USA		30	GDV	GLENDIVE, MONT., USA
29	GGN	GLASGOW, MONT., USA		32	GRH	GRAND ISLAND, NEBR., USA
31	GID	GOODLAND, KAN., USA		34	GTF	GREAT FALLS, MONT., USA
33	GJT	GRAND JUNCTION, COLO., USA		36	HHD	HARRISON, ARK., USA
35	GUC	GUINNISON, COLO., USA		38	HVH	HAVRE, MONT., USA
37	HST	HASTINGS, NEBR., USA		40	HOT	HOT SPRINGS, ARK., USA
39	HYS	HAYS, KAN., USA		42	JLN	JOPLIN, MO., USA
41	JAC	JACKSON, WYO., USA		44	EAR	KEARNEY, NEBR., USA
43	NCI	KANSAS CITY, MO., USA		46	LAK	LAKARIE, WYO., USA
45	LAA	LAMAR, COLO., USA		48	LAN	LANTON, OKLA., USA
47	LAS	LAS VEGAS, NEV., USA		50	LBL	LIBERAL, KAN., USA
49	LWT	LEWISTOWN, MONT., USA		52	LIT	LITTLE ROCK, ARK., USA
51	LNK	LINCOLN, NEBR., USA		54	MCK	MC COOK, NEBR., USA
53	MHK	MANHATTAN, KAN., USA		56	MLS	MILES CITY, MONT., USA
55	MEM	MEMPHIS, TENN., USA		58	MZO	MISSOULA, MONT., USA
57	MOT	MINOT, N.D., USA		60	MKO	MUSKOGEE, OKLA., USA
59	MTJ	MONROSE, COLO., USA		62	OKC	OKLAHOMA CITY, OKLA., USA
61	LBF	NORTH PLATTE, NEBR., USA		64	PHX	PHOENIX, ARIZ., USA
63	OMA	OMAHA, NEBR., USA		66	PHX	PHOENIX, ARIZ., USA
65	PPF	PARSONS, KAN., USA		68	PUB	PUEBLO, COLO., USA
67	PNC	PONCA CITY, OKLA., USA		70	RIN	RIVERTON, WYO., USA
69	RAP	RAPID CITY, S.D., USA		72	SLN	SALINA, KAN., USA
71	HKS	ROCK SPRINGS, WYO., USA		74	SHF	SCOTTSDUFF, NEBR., USA
73	SIC	SALT LAKE CITY, UTAH, USA		76	SNY	SIDNEY, NEBR., USA
75	SOY	SIDNEY, MONT., USA		78	SIL	ST. LOUIS, MO., USA
77	SVC	SILVER CITY, N.M., USA				

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194	FL	FRONTIER AIRLINES		
79	HON	STEAMBOAT SPRINGS, COLO., USA	80	SND
81	TUP	TOPEKA, KAN., USA	82	TUS
83	TUL	TULSA, OKLA., USA	84	VEL
85	MYS	WEST YELLOWSTONE, MONT., USA	86	WCT
87	TSN	WILLISTON, N.D., USA	88	WIN
89	OLF	MOLE POINT, MONT., USA	90	WRL
195	GA	GARUDA INDONESIAN AIRWAYS		
1	AMU	AMBON, MOLUCCA IS., INDONESIA	2	AMI
3	AMS	AMSTERDAM, NETHERLANDS	4	ATH
5	BEN	BALIKPAPAN, BORNEO, INDONESIA	6	BJJ
7	BKK	BANGKOK, THAILAND	8	BUJ
9	BKS	BENGKULU, SUMATRA, INDONESIA	10	BIK
11	BOM	BOMBAY, INDIA	12	CMB
13	OPS	DENPASAR, BALI, INDONESIA	14	FRA
15	HKG	HONG KONG, BR CROWN COLONY	16	JKT
17	DJB	JAMBI, INDONESIA	18	JOG
19	KHZ	KARACHI, PAKISTAN	20	KDI
21	KUL	KUALA LUMPUR, MALAYSIA	22	KUE
23	MES	MEDAN, SUMATRA, INDONESIA	24	MOC
25	PDG	PADANG, SUMATRA, INDONESIA	26	PKU
27	PLM	PATEMBANG, SUMATRA, INDONESIA	28	PKR
29	LBB	PARIS, FRANCE-LE BOURGET ARPT	30	PNK
31	FCO	ROME, ITALY-LEONARDO DA VINCI ARPT	32	SRG
33	SIN	SINGAPORE, SINGAPORE	34	SUB
35	SYD	SYDNEY, NSW AUSTRALIA	36	TJO
37	TNJ	TANJUNG PINANG, BINTAN, INDO.	38	TKG
39	UPG	UJUNG PANDANG, CELEBES, INDO.		
196	GO	GCS AIRLINES		
1	CLE	CLEVELAND, OHIO, USA	2	GOD
3	MFD	MANFESTED, OHIO, USA		
197	YY	GENERAL AIR		
1	BRE	BREMEN, GERMANY	2	CUN
3	FRA	FRANKFURT, GERMANY	4	HAM
5	HGL	HEILIGOLAND, GERMANY	6	NVR
7	KSF	KASSEL, GERMANY	8	LGB
9	MUC	MUNICH, GERMANY	10	WTU
11	AGE	MANGERODDE, GERMANY	12	GUT
198	GD	GEYSERLAND AIRWAYS LTD.		
1	AKL	NUCKLAND, NEW ZEALAND	2	GJS
3	AKO	KAIKOURA, NEW ZEALAND	4	KWV
5	MIA	MAITAMA, NEW ZEALAND	6	RDT
199	GH	GHANA AIRWAYS		
1	ABJ	ABIDJAN, IVORY COAST	2	ACC

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214	HY	HOUSTON METRO AIRLINES			
1	BPT	BEAUMONT/PT. ARTHUR, TEX., USA	2	CLC	CLEAR LAKE CITY, TEXAS, USA
3	GLS	GALVESTON, TEXAS, USA	4	IAH	HOUSTON, TEXAS, USA
5	LJN	LAKE JACKSON, TEXAS, USA	6	VCT	VICTORIA, TEXAS, USA
215	XE	HUB AIRLINES-AIR-TAXI			
1	BTL	BATTLE CREEK, MICH., USA	2	CGX	CHICAGO, ILL-MEIGS FIELD, USA.
3	DAD	CHICAGO, ILL-O'HARF ARPT, USA.	4	DET	DETROIT, MICH-CITY ARPT, USA
5	DTW	DETROIT, MICH-METROPOLITAN API, USA	6	FNA	FT. WAYNE, IND., USA
216	RW	HUGHES AIRWEST			
1	APV	APPLE VALLEY, CALIF., USA	2	AST	ASTORIA, ORE., USA
3	BFL	BAKERSFIELD, CALIF., USA	4	BLH	BLYTHE, CALIF., USA
5	B01	BOISE, IDAHO, USA	6	BUR	BURBANK, CALIF., USA
7	YYC	CALGARY, ALTA., CANADA	8	C0L	CEDAR CITY, UTAH, USA
9	CIC	CHICO, CALIF., USA	10	CEC	CRESCENT CITY, CALIF., USA
11	IPL	EL CENTRO, CALIF., USA	12	EPH	EPHRATA, WASH., USA
13	EUG	EUGENE, ORE., USA	14	ACV	EUREKA/ARCATA, CALIF., USA
15	FAT	FRESNO, CALIF., USA	16	GCN	GRAND CANYON, ARIZ., USA
17	GTF	GREAT FALLS, MONT., USA	18	GDL	GUADALAJARA, MEXICO
19	HOM	HONOLULU, WASH., USA	20	IDA	IDAHO FALLS, IDAHO, USA
21	IYK	INYO KERN, CALIF., USA	22	FCA	KALISPELL, MONT., USA
23	IGM	KINGMAN, ARIZ., USA	24	LMT	KLAMATH FALLS, ORE., USA
25	LAP	LA PAZ, MEXICO	26	LHD	LAKE HAVASU CITY, ARIZ., USA
27	TVL	LAKE TAHOE, CALIF., USA	28	LAS	LAS VEGAS, NEV., USA.
29	LWS	LEWISTON, IDAHO, USA	30	LAX	LOS ANGELES, CALIF., USA
31	MZT	MAZATLAN, MEXICO	32	MFR	MEDFORD, ORE., USA
33	MAY	MONTEREY, CALIF., USA	34	OTH	NORTH BEND, ORE., USA
35	OAK	OAKLAND, CALIF., USA	36	ULM	OLYMPIA, WASH., USA
37	ONT	ONTARIO, CALIF., USA	38	UXR	OXNARD, CALIF., USA
39	PGA	PAGE, ARIZ., USA	40	PSP	PALM SPRINGS, CALIF., USA
41	PMD	PALMIALE, CALIF., USA	42	PSC	PASCO, WASH., USA
43	PRD	PASO ROBLES, CALIF., USA	44	PHX	PHOENIX, ARIZ., USA
45	PIH	POCATELLO, IDAHO, USA	46	PDX	PORTLAND, ORE., USA.
47	PVR	PUERTO VALLARTA, MEXICO	48	PUN	PULLMAN, WASH., USA
49	RDO	REDDING, CALIF., USA	50	RDM	REDMOND, ORE., USA
51	RNO	RENO, NEV., USA	52	SMF	SACRAMENTO, CALIF., USA
53	SLC	SALT LAKE CITY, UTAH, USA	54	SAN	SAN DIEGO, CALIF., USA
55	SFO	SAN FRANCISCO, CALIF., USA	56	SJC	SAN JOSE, CALIF., USA
57	SNA	SANTA ANA, CALIF., USA	58	SBA	SANTA BARBARA, CALIF., USA
59	SMX	SANTA MARIA, CALIF., USA	60	STS	SANTA ROSA, CALIF., USA
61	SEA	SEATTLE, WASH., USA	62	REG	SPokane, WASH., USA
63	SCK	STOCKTON, CALIF., USA	64	TUS	TUCSON, ARIZ., USA
65	TUF	TWIN FALLS, IDAHO, USA	66	ALN	WAHL WAHL, WASH., USA
67	EWI	WEWAHTEEE, WASH., USA	68	YKT	YAKIMA, WASH., USA
69	YUN	YUMA, ARIZ., USA			
217	18	IBERIA			
1	ALC	ALICANTE, SPAIN	2	LEI	ALMERIA, SPAIN

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286	NP	NOR-CAL AVIATION, INC.	
	5	SME SACRAMENTO, CALIF., USA	
287	NK	NORCANAIR	
1	YVC	LAC LA RONGE, SASK.	2 YPA PRINCE ALBERT, SASK.
3	YRH	REGINA, SASK.	4 YXE SASKATOON, SASK.
5	YSF	STONEY RAPIDS, SASK.	6 YBE URANIUM CITY, SASK.
7	ZWL	MOLLASTON LAKE, SASK.	
288	ND	NORDAIR	
1	YMT	CHIBOURGARAND, QUEBEC	2 YGY DECEPTION BAY, QUE.
3	YKU	FORT GEORGE, QUEBEC	4 YFB FROBISHER BAY, N.W.T.
5	YVP	FT. CHINO, QUE.	6 YGW GREAT WHALE, QUE.
7	YUX	HALL BEACH, N.W.T.	8 YHM HAMILTON, ONT.
9	YWS	LA GRANDE, QUEBEC, CANADA	10 YNU MATAGAMI, QUEBEC, CANADA
11	YUL	MONTRÉAL, QUE., CANADA	12 YUN OTTAWA, ONTARIO, CANADA
13	PIT	PITTSBURGH, PA., USA	14 YRB RESOLUTE BAY, N.W.T.
15	YVO	VILLE D'OR, QUE.	16 YQG WINDSOR, ONT., CANADA
289	NR	NORONTAIR	
1	YXR	EARLTON, ONT.	2 YAM SAULT STE MARIE, ONT.
3	YSB	SUDSBURY, ONT.	4 YTS TIMMINS, ONT.
290	JV	NORTH CAY AIRWAYS	
1	BQN	AGUADILLA, P.R.	2 CPX COLEBRA, PUERTO RICO
3	MAZ	MAYAGUEZ, PUERTO RICO	4 PSE PONCE, PUERTO RICO
5	SIG	SAN JUAN, P.R.-ISLA GRANDE APT	6 SJU SAN JUAN, PUERTO RICO
7	SIX	ST. CROIX, VIRGIN IS.	8 STT ST. THOMAS, VIRGIN IS.
9	VQS	VIEQUES, PUERTO RICO	
291	NC	NORTH CENTRAL AIRLINES	
1	ABR	ABERDEEN, S.D., USA	2 APN ALPENA, MICH., USA
3	JVL	BELOIT/JANESVILLE, WIS., USA	4 BJT BEMIDJI, MINN., USA
5	BEH	BENTON HARBOR, MICH., USA	6 BIS BISMARCK, N.D., USA
7	BRD	BRAINERD, MINN., USA	8 BRX BROOKINGS, S.D., USA
9	MDN	CHICAGO, ILL-MIDWAY APT, USA	10 OND CHICAGO, ILL-O'HARE APT, USA
11	CVG	CINCINNATI, OHIO, USA	12 CLE CLEVELAND, OHIO, USA
13	CMH	COLUMBUS, OHIO, USA	14 DAY DAYTON, OHIO, USA
15	DEN	DENVER, COLOR., USA	16 DTW DETROIT, MICH-METROPOLITAN APT, USA
17	DVL	DEVILS LAKE, N.D., USA	18 DLH DULUTH, MINN., USA
19	EAU	EAU CLAIRE, WIS., USA	20 ESC ESCANABA, MICH., USA
21	FHM	FAIRMONT, MINN., USA	22 FAR FARIBORO, N.B., USA
23	FNT	FLINT, MICH., USA	24 GFK GRAND FORKS, N.D., USA
25	GRR	GRAND RAPIDS, MICH., USA	26 GRB GREEN BAY, WIS., USA
27	GMA	HANCOCK, MICH., USA	28 HIB HIBBING, MINN., USA
29	HUN	HURON, S.D., USA	30 INL INT'L FALLS, MINN., USA
31	JNT	IRON MOUNTAIN, MICH., USA	32 IMD IRONWOOD, MICH., USA
33	JAN	JACKSON, MICH., USA	34 AZO KALAMAZOO, MICH., USA
35	MCI	KANSAS CITY, MO., USA	36 LSE LA CROSSE, WIS., USA

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291	NC	NORTH CENTRAL AIRLINES			
37	LAN	LANSING, MICH., USA	38	MSN	MADISON, WIS., USA
39	PBL	MANISTEE, MICH., USA	40	MFW	MANITOWOC, WIS., USA
41	MKT	MANKATO, MINN., USA	42	MQT	MARQUETTE, MICH., USA
43	MNM	MEMPHINIE, MICH., USA	44	MKE	MILWAUKEE, WIS., USA
45	MSP	MINNEAPOLIS/ST PAUL, MINN., USA	46	MNU	MILNOT, N.D., USA
47	MHE	MITCHELL, S.D., USA	48	MKG	MUSKEGON, MICH., USA
49	LGA	NEW YORK, NY-LA GUARDIA ARPT., USA	50	NEK	NEBRASKA, NEBR., USA
51	OMA	OMAHA, NEBR., USA	52	OSH	OSHKOSH, WIS., USA
53	PLN	PELLSTON, MICH., USA	54	PIR	PIERRE, S.D., USA
55	RAP	RAPID CITY, S.D., USA	56	RHI	RHINELANDER, WIS., USA
57	RST	ROCHESTER, MINN., USA	58	MBS	SAGINAW, MICH., USA
59	SSM	SAULT STE MARIE, MICH., USA	60	SUX	SIOUX CITY, IOWA, USA
61	FSD	SIOUX FALLS, S.D., USA	62	SBN	SOUTH BEND, INDI., USA
63	TRF	TRIEF RIVER FALLS, MINN., USA	64	YOT	THUNDER BAY, ONT.
65	YYZ	TORONTO, ONT., CANADA	66	TVC	TRAVERSE CITY, MICH., USA
67	ATY	WATERDOWN, S.D., USA	68	CNA	WAUSAU, WISC-CENTRAL WIS ARPT. USA
69	WTG	WURTHINGTON, MINN., USA	70	YKN	YANKTON, S.D., USA
292	NS	NORTHEAST AIRLINES LIMITED			
1	AMS	AMSTERDAM, NETHERLANDS	2	BFS	BELFAST, N. IRELAND
3	BIO	BILBAO, SPAIN	4	BOD	BORDEAUX, FRANCE
5	DUB	DUBLIN, IRELAND	6	GCI	GUERNSEY, CHANNEL IS., U.K.
7	JER	JERSEY, CHANNEL IS., U.K.	8	KLU	KLAGENFURT, AUSTRIA
9	LBA	LEEDS/BRADFORD, ENGLAND	10	LHR	London, ENGLAND-HEATHROW ARPT
11	LUX	LUXEMBOURG, LUXEMBOURG	12	NCL	NEWCASTLE, ENGLAND
293	WS	NORTHERN WINGS LTD.			
1	YBX	BLANC SABLON, QUE.	2	ZGS	GETHSEMAMI, QUEBEC
3	YHR	HARRINGTON HARBOUR, QUE.	4	YGV	RAVRE ST. PIERRE, QUE.
5	ZKG	KEGASKA, QUEBEC	6	ZLT	LA TABATIERE, QUEBEC
7	YLP	MINGAN, QUE.	8	YNA	NATASHQUAN, QUE.
9	ZFB	OLD FORT BAY, QUEBEC	10	YIN	RIVIERE AU TONNERRE, QUE.
11	YZV	SEVEN ISLANDS, QUE.	12	YJF	ST. AUGUSTIN, QUE.
13	ZSP	ST. PAUL, QUEBEC	14	YJH	WHALEHEAD, QUEBEC
294	HR	NORTHWARD AIRLINES LTD.			
1	LAK	AKLAVIK, N.W.T.	2	YJM	ARTIC RED RIVER, N.W.T.
3	YDA	DAWSON CITY, Y.T.	4	YNJ	FORT FRANKLIN, N.W.T.
5	YGR	FT. GOOD HOPE, N.W.T.	6	ZFM	FT. MCPHERSON, N.W.T.
7	ZFN	FT. NORMAN, N.W.T.	8	YEV	INUVIK, NWT
9	YMA	MAYO, Y.T.	10	YYD	NORMAN WELLS, NWT
11	YUB	TUKTOYAKTUK, N.W.T.	12	YXY	WHITEHORSE, Y.T.
295	NW	NORTHWEST ORIENT AIRLINES			
1	ANC	ANCHORAGE, ALASKA, USA.	2	ATL	ATLANTA, GA., USA
3	BIL	BILLINGS, MONT., USA	4	BIS	BISMARCK, N.D., USA
5	BOS	BOSTON, MASS., USA	6	BZN	BOZEMAN, MONT., USA
7	BTM	BUTTE, MONT., USA	8	CHW	CHICAGO, ILL-MIDWAY ARPT., USA.

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296	OA	OLYMPIC AIRWAYS		
53	ZRH	ZURICH, SWITZERLAND		
297	DB	OPAL AIR SERVICES		
1	ADL	ADELAIDE, S. AUSTRALIA	2	ADD ANDAMOOKA, S. AUST.
3	AYD	AYERS ROCK, NT, AUSTRALIA	4	CPO COOBER PEDY, S. AUSTRALIA
298	OL	OSTERREISCHE LUFTTRANSPORT GMBH		
1	WIV	BURKUM, GERMANY	2	DUS DUSSELDORF, GERMANY
3	WTX	EMDEN, GERMANY	4	WHB HAGE, GERMANY
5	HAJ	HANOVER, GERMANY	6	HGL HELGOLAND, GERMANY
7	WVU	JUIST, GERMANY	8	WVP LANGEORG, GERMANY
9	WTU	NORDERNEY, GERMANY	10	AGE WANGERROUGE, GERMANY
299	UE	OUT ISLAND AIRWAYS		
1	ASD	ANDROS TOWN, BAHAMAS	2	UBL CHUB CAY, BAHAMAS
3	CRI	CROOKED ISLAND, BAHAMAS	4	CJI DEADMAN'S CAY, I.T., BAH
5	FPO	FREEPORT, BAHAMAS	6	GGT GEORGE TOWN, BAHAMAS
7	GHC	GOVERNORS HARBOUR, BAH.	8	GHC GREAT HARBOUR CAY, BAH.
9	IGA	INNIBA, BAHAMAS	10	MAY MANGROVE CAY, BAHAMAS
11	MMI	MARSH HARBOUR, BAHAMAS	12	MYG MAYAGUANA, BAHAMAS
13	MIA	MIAMI, FLA., USA	14	NAS NASSAU, BAHAMAS
15	ELM	NORTH ELEUTHERA, BAHAMAS	16	SAD SAN ANDROS, ANDROS IS., BAH.
17	ZSA	SAN SALVADOR, BAHAMAS	18	TZN SOUTH ANDROS, BAHAMAS
19	SAL	STELLA MARIS, LONG IS., BAH.	20	BIG THE BIGHT, BAHAMAS
21	TCB	TREASURE CAY, BAHAMAS		
300	OZ	OZARK AIRLINES		
1	BMI	BLOOMINGTON, ILL., USA	2	BRL BURLINGTON, IOWA, USA
3	CBI	CAPE GIRARDEAU, MO., USA	4	CIB CEDAR RAPIDS/IOWA CITY, IAH., USA
5	CMZ	CHAMPAIGN, ILL., USA	6	MDW CHICAGO, ILL-MIDWAY ARPT, USA
7	ORD	CHICAGO, ILL-OHARE ARPT, USA	8	CKV CLARKSVILLE, TENN., USA
9	CNT	CLINTON, IOWA, USA	10	CUB COLUMBIA, MO., USA
11	DAL	DALLAS/FT. WORTH, TEXAS, USA	12	DEC DECATOR, ILL., USA
13	DEN	DENVER, COLO., USA	14	DSM DES MOINES, IOWA, USA
15	DQO	DOUBUQUE, IOWA, USA	16	FOD FT. DODGE, IOWA, USA
17	TBN	FT. LEONARD WOOD, MO., USA	18	GBG GALESBURG, ILL., USA
19	IND	INDIANAPOLIS, IND., USA	20	JLN JOPLIN, MO., USA
21	KCI	KANSAS CITY, MO., USA	22	KRK KIRKSVILLE, MO., USA
23	ATZ	LAKE OF THE OZARKS, MO., USA	24	SOF LOUISVILLE, KY., USA
25	MSN	MADISON, WIS., USA	26	MMR MARION, ILL., USA
27	MOM	MINON CITY, IOWA, USA	28	MTO MATTOON, ILL., USA
29	MKE	MILWAUKEE, WIS., USA	30	MSP MINNEAPOLIS/ST PAUL, MINN., USA
31	MLI	MOLINE, ILL., USA	32	MVN MOUNT VERNON, ILL., USA
33	BNA	NASHVILLE, TENN., USA	34	LGA NEW YORK, NY-LGA GUARDIA ARPT., USA
35	OMA	OMAHA, NEBR., USA	36	OTM OTTUMWA, IOWA, USA
37	OMB	OWENSBOURG, KY., USA	38	PAB PAULSBURG, KY., USA
39	FIA	PEORIA, ILL., USA	40	QIN QUINCY, ILL., USA
41	HST	ROCHESTER, MINN., USA	42	RFD ROCKFORD, ILL., USA

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300	02	OZARK AIRLINES					
43	SIX	SIOUX CITY, IOWA, USA	44	FSD	SIOUX FALLS, S.D., USA		
45	SPI	SPRINGFIELD, ILL., USA	46	SGF	SPRINGFIELD, MO., USA		
47	STL	ST. LOUIS, MO., USA	48	SQI	STERLING/ROCK FALLS, ILL., USA		
49	TUL	TULSA, OKLA., USA	50	TAU	WASHINGTON, DC-NULLES ARPT., USA		
51	ALU	WATERLOO, IOWA, USA					
301	PS	PACIFIC SOUTHWEST AIRLINES-INTRA-STATE					
1	BDR	BURBANK, CALIF., USA	2	FAT	FRESNO, CALIF., USA		
3	LGB	LONG BEACH, CALIF., USA	4	LAX	LOS ANGELES, CALIF., USA		
5	DAK	OAKLAND, CALIF., USA	6	DNT	ONTARIO, CALIF., USA		
7	SAC	SACRAMENTO, CALIF., USA	8	SAN	SAN DIEGO, CALIF., USA		
9	SFO	SAN FRANCISCO, CALIF., USA	10	SJC	SAN JOSE, CALIF., USA		
11	SCK	STOCKTON, CALIF., USA					
302	PW	PACIFIC WESTERN AIRLINES					
1	BBU	BELLA BELLA, B.C., CANADA	2	BCB	BELLA Coola, B.C.		
3	YYC	CALGARY, ALTA., CANADA	4	YCB	CAMPBELL BAY, NWT		
5	YBL	CAMPBELL RIVER, B.C.	6	YCH	CATSFEGAR, B.C.		
7	YDD	DAIRY, B.C.	8	YXC	CRANBROOK, B.C.		
9	YDQ	DAWSON CREEK, B.C.	10	YAB	EDMONTON, ALTA., CANADA		
11	YEG	EDMONTON, ALTA-INT APT, CANADA	12	YPY	FT. CHIPEWYAN, ALBERTA		
13	YMH	FT. MCMURRAY, ALTA.	14	YER	FT. RESOLUTION, N.W.T.		
15	YFS	FT. SIMPSON, NWT	16	YSM	FT. SMITH, N.W.T.		
17	YGF	GRAND FORKS, B.C.	18	YHY	HAY RIVER, NWT		
19	YQJ	HIGH LEVEL, ALBERTA	20	YEV	INUVIK, NWT		
21	YKA	KAMLOOPS, B.C.	22	YLM	KELLOGG, B.C.		
23	WVN	NAMU, B.C., CANADA	24	YVQ	NORMAN WELLS, NWT		
25	ZOF	OCEAN FALLS, B.C.	26	YPE	PEACE RIVER, ALTA.		
27	YYF	PENTICTON, B.C.	28	YZI	PORT HARDY, B.C.		
29	YPN	PONELL RIVER, B.C.	30	YXS	PRINCE GEORGE, B.C.		
31	WPF	PRINCE RUPERT, B.C.-DIGBY ISLAND	32	YQZ	QUESNEL, B.C.		
33	YRD	RAINBOW LAKE, ALTA.	34	YRB	RESOLUTE BAY, N.W.T.		
35	YZP	SANDSPIT, B.C.	36	SEA	SEATTLE, WASH., USA		
37	YYD	SMITHERS, B.C.	38	ZTS	TAHSTIS, B.C.		
39	YXT	TERRACE, B.C.	40	YAZ	TOFINO, BRITISH COLUMBIA		
41	YBE	URANIUM CITY, SASK.	42	YVR	VANCOUVER, B.C., CANADA		
43	YYJ	VICTORIA, B.C.	44	YMI	WILLISTON LAKE, B.C.		
45	YQY	WHITELEY, NWT	46	YZF	YELLOWKNIFE, N.W.T.		
303	PK	PAKISTAN INTERNATIONAL					
1	AII	ABU DHABI, THUOTIYE DABO	2	ADL	ADEN, DEM. REP. OF YEMEN		
3	AMS	AMSTERDAM, NETHERLANDS	4	ATH	ATHENS, GREECE		
5	BAG	BAGHDAD, IRAQ	6	BAA	Bahrain Isl., BAHRAIN GULF		
7	BKK	BANGKOK, THAILAND	8	BEY	BETRUY, LEBANON		
9	CAI	CAIRO, ARAB REP OF EGYPT	10	CJL	CHITRAL, PAKISTAN		
11	CMB	COLOMBO, REP. OF SRI LANKA	12	DAM	DAMASCUS, ARAB REP OF SYRIA		
13	DAR	DAR ES SALAAM, TANZANIA	14	DSK	DEERA ISMAIL, PAKISTAN		
15	UHA	DRAHRAN, SAUDI ARABIA	16	DOH	DOHA, QATAR, ARABIA		

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308	EB	PENNSYLVANIA COMMUTER-AIR TAXI		
	3	MOT HARRISBURG, PA-INTERNATIONAL ARPT.	4	LNG LANCASTER, PA., USA
	5	SCE STATE COLLEGE, PA., USA	6	USA WASHINGTON, DC-NATIONAL ARPT., USA
309	PR	PHILIPPINE AIRLINES		
	1	AMS AMSTERDAM, NETHERLANDS	2	BPK BIKAK, PHILIPPINE IS.
	3	BCD BACOLOD, PHILIPPINE IS.	4	BAG BAGUIO, PHILIPPINE IS.
	5	BKK BANGKOK, THAILAND	6	BSP BASCO, PHILIPPINE IS.
	7	BIN BISIG, PHILIPPINE IS	8	BDO BOTON, PHILIPPINE IS.
	9	CAG CAGAYAN DE ORO, PHILIPPINE IS	10	CYP CALBAYOG, PHILIPPINE IS.
	11	CRM CATAKMAN, PHILIPPINE IS.	12	CYU CAUAYAN, PHILIPPINE IS.
	13	CLB CLBU, PHILIPPINE IS.	14	CBO CUTABMO, PHILIPPINE IS.
	15	DVO DAVAO, PHILIPPINE IS	16	DOT DUMAGUETE, PHILIPPINE IS.
	17	FRA FRANKFURT, GERMANY	18	GES GENERAL SANTOS, PHILIPPINE IS.
	19	HKG HONG KONG, BR CHINA COLONY	20	HNL HONOLULU, OAHU, HAWAII, USA
	21	IGN ILIGAN, PHILIPPINE IS.	22	ILO ILOILO, PHILIPPINE IS
	23	KHI KARACHI, PAKISTAN	24	LGP LEGASPI, PHILIPPINE IS
	25	MNL MANILA, PHILIPPINE IS	26	MEL MELBOURNE, VIC., AUSTRALIA
	27	WNP NAGA, PHILIPPINE IS.	28	OZC OZAMIS CITY, PHILIPPINE IS
	29	PPS PUERTO PRINCESA, PHILIPPINE IS	30	FLO ROME, ITALY-LEONARDO DA VINCI ARPT
	31	SFO SAN FRANCISCO, CALIF., USA	32	SJI SAN JOSE, PHILIPPINE IS
	33	SIN SINGAPORE, SINGAPORE	34	SUG SURIGAO, PHILIPPINE IS.
	35	SYD SYDNEY, NSW AUSTRALIA	36	TAC TACLOBAN, PHILIPPINE IS
	37	TPE TAIPEI, REP. OF CHINA (TAIWAN)	38	HND TOKYO, JAPAN-HANEDA AIRPORT
	39	TUG TUGUEGARAO, PHILIPPINE IS	40	VRC VIRAC, PHILIPPINE IS
	41	ZAM ZAMBOANGA, PHILIPPINE IS		
310	PP	PHILLIPS AIRLINES		
	1	UND CHICAGO, ILL-MIDWAY ARPT., USA.	2	MIG MICHIGAN CITY, IND., USA
	3	VPI VALPARAISO, INDI., USA		
311	FR	PHILLIPS FLYING SERVICE INC.		
	1	MIV MACKINAC ISLAND, MICH., USA	2	PEI PELSTON, MICH., USA
312	P1	PIEDMONT AVIATION		
	1	AVL ASHEVILLE, N.C., USA	2	ATL ATLANTA, GA., USA
	3	AGS AUGUSTA, GA., USA	4	BAL BALTIMORE, MD., USA
	5	BKN BECKLEY, W. VA., USA	6	BLF BLUEFIELD, W. VA., USA
	7	CRS CHARLESTON, S.C., USA	8	CHW CHARLESTON, W. VA., USA
	9	CLT CHARLOTTE, N.C., USA	10	CHO CHARLOTTEVILLE, VA., USA
	11	MID CHICAGO, ILL-MIDWAY ARPT., USA.	12	CVR CINCINNATI, OHIO, USA
	13	CAB COLUMBIA, S.C., USA	14	CMB COLUMBUS, OHIO, USA
	15	DAN DANVILLE, VA., USA	16	FAY FAYETTEVILLE, N.C., USA
	17	FLO FLORENCE, S.C., USA	18	GSB GOLDSBORO, N.C., USA
	19	LNB GREENBRIER, W. VA., USA	20	GSU GREENSBORO, N.C., USA
	21	GSP GREENVILLE/SPARTANBURG, SC, USA	22	HKY HICKORY, N.C., USA
	23	HSP HOT SPRINGS, VA., USA	24	HIV HUNTINGTON, W. VA., USA
	25	JAJ JACKSONVILLE, N.C., USA	26	KSD Kinston, N.C., USA
	27	TYS KNOXVILLE, TENN., USA	28	LEX LEXINGTON, KY., USA

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312	P1	PIEDMONT AVIATION					
29	L02	LONDON, KY., USA	30	SDF	LOUISVILLE, KY., USA		
31	LYH	LYNCHBURG, VA., USA	32	MEM	MEMPHIS, TENN., USA		
33	CHE	MYRTLE BEACH, S.C., USA	34	BNA	NASHVILLE, TENN., USA		
35	FHN	NCN BERN, N.C., USA	36	LGA	NEW YORK, NY-LA GUARDIA ARPT., USA		
37	EHH	NEW YORK, NY-NEWARK ARPT., USA	38	PHF	NEWPORT NEWS, VA., USA		
39	ORF	NORFOLK, VA., USA	40	PKB	PARKERSBURG, W. VA., USA		
41	RDU	RALEIGH/DURHAM, N.C., USA	42	RTC	RICHMOND, VA., USA		
43	HUA	ROANOKE, VA., USA	44	RWJ	RUCKY MOUNT/WILSON, N.C., USA		
45	SHD	STAUNTON, VA., USA	46	TBI	TRI-CITY AIRPORT, TENN., USA		
47	JAD	WASHINGTON, DC-DULLES ARPT., USA	48	DCA	WASHINGTON, DC-NATIONAL ARPT., USA		
49	ILM	WILMINGTON, N.C., USA	50	INT	WINSTON SALEM, N.C., USA		
313	PM	PILGRIM-AIR-TAXI					
1	ALB	ALBANY, N.Y., USA	2	BOS	BOSTON, MASS., USA		
3	BDR	BIDGEPORT, CONN., USA	4	BOL	HARTFORD, CONN., USA		
5	HVN	NEW HAVEN, CONN., USA	6	GDN	NEW LONDON, CONN., USA		
7	JFK	NEW YORK, NY-KENNEDY INT ARPT., USA					
314	NN	PINEHURST AIRLINES INC.					
1	CLT	CHARLOTTE, N.C., USA	2	NSS	PINEHURST, N.C., USA		
3	RDU	RALEIGH/DURHAM, N.C., USA					
315	PU	FLUWA					
1	ATI	ARTIGAS, URUGUAY	2	ASU	ASUNCION, PARAGUAY		
3	BUV	BELLA UNION, URUGUAY	4	AEP	BUENOS AIRES, ARG-AEROPARQUE ARPT		
5	MVD	MONTEVIDEO, URUGUAY	6	POU	PAYSANDU, URUGUAY		
7	PDP	PUNTA DEL ESTE, URUGUAY	8	RVY	RIVERA, URUGUAY		
9	STY	SALTO, URUGUAY	10	VCR	VICHAEDO, URUGUAY		
316	LO	POLISH AIRLINES					
1	AMS	AMSTERDAM, NETHERLANDS	2	ATH	ATHENS, GREECE		
3	BGR	BAGHDAD, IRAQ	4	BLY	BETRUT, LEBANON		
5	BEG	BELGRADE, YUGOSLAVIA	6	SXF	BERLIN, GER. DEM. REP.		
7	BRU	BRUSSELS, BELGIUM	8	OTP	BUCHAREST, ROM-OTPENI ARPT		
9	BUD	BUDAPEST, HUNGARY	10	BZG	BYDGOSZCZ, POLAND		
11	CAI	CAIRO, ARAB REP OF EGYPT	12	CND	CONSTANTA, ROMANIA		
13	CPH	COPENHAGEN, DENMARK	14	DAM	DAMASCUS, ARAB REP OF SYRIA		
15	DBV	DUBROVNIK, YUGOSLAVIA	16	FRN	FRANKFURT, GERMANY		
17	GDN	GDANSK, POLAND	18	GVA	GENEVA, SWITZERLAND		
19	HAM	HAMBURG, GERMANY	20	HEL	HELSINKI, FINLAND		
21	IST	ISTANBUL, TURKEY	22	KTN	KATOWICE, POLAND		
23	IEV	KIEV, USSR	24	KZL	KOSZALIN, POLAND		
25	KRK	KRAKOW, POLAND	26	LFO	Leningrad, USSR		
27	LHR	LONDON, ENGLAND-HEATHROW ARPT	28	MAD	MADRID, SPAIN		
29	LIN	MILAN, ITALY-FORLANINI-LINATE	30	SVO	MOSCOW, USSR-SHEREMETYEVU ARPT		
31	JFK	NEW YORK, NY-KENNEDY INT ARPT., USA	32	NIC	NICOSIA, CYPRUS		
33	CBG	PARIS, FRANCE-LE BOURGET ARPT	34	POZ	POZNAN, POLAND		
35	PRG	PRAGUE, CZECHOSLOVAKIA	36	RJK	RJeka, YUGOSLAVIA		

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359	SA	SOUTH AFRICAN AIRWAYS			
27	MRI	MAURITIUS, INDIAN OCEAN			
29	JFK	NEW YORK, NY-KENNEDY INT'L APRT., USA	30	QUB	QUEBEC CITY, QUEBEC, CANADA
31	DHY	PARIS, FRANCE-ORLY APRT.	32	PER	PERTH, N. AUSTRALIA
33	PWZ	PIETRENBURG, REP OF S. AFRICA	34	PIZ	PORT ELIZABETH, REP OF S. AFRICA
35	GIG	RIO DE JANEIRO, BRAZIL-GALEAO APRT.	36	FCD	ROME, ITALY-LEONARDO DA VINCI APRT.
37	STD	SAL ISLAND, CAPE VERDE IS	38	SAY	SALISBURY, RHODESIA
39	SYD	SYDNEY, NSW AUSTRALIA	40	LVI	TANANARIVE, MADAGASCAR
41	UIN	UJUNDJUN, REP OF S. AFRICA	42	VIE	VIENNA, AUSTRIA
43	WHD	WINDHOEK, S. W. AFRICA	44	ZRH	ZURICH, SWITZERLAND
360	SL	SOUTHEAST AIRLINES, INC.-AIR TAXI			
1	EYW	KEY WEST, FLA., USA	2	MTH	MARATHON, FLA., USA
3	MIA	MIAMI, FLA., USA			
361	YC	SOUTHEAST COMMUTER AIRLINES			
1	BHM	BIRMINGHAM, ALA., USA	2	NOB	MOBILE, ALA., USA
3	HGM	MONROVIA, ALA., USA			
362	SO	SOUTHERN AIRWAYS			
1	ABY	ALBANY, GA., USA	2	AND	ANDERSON, S.C., USA
3	ANB	ANNISTON, ALA., USA	4	AHN	ATHENS, GA., USA
5	ATL	ATLANTA, GA., USA	6	BTK	BATON ROUGE, LA., USA
7	BHM	BIRMINGHAM, ALA., USA	8	CBS	CHARLESTON, S.C., USA
9	CLT	CHARLOTTE, N.C., USA	10	CHA	CHATTANOOGA, TENN., USA
11	MDW	CHICAGO, ILL-MIDWAY APRT., USA	12	CME	COLUMBIA, S.C., USA
13	CGG	COLUMBUS, GA., USA	14	CGH	COLUMBUS, MISS., USA
15	CSV	CROSSVILLE, TENN., USA	16	DHN	DOOTHAN, ALA., USA
17	VPS	EGLEN A.F. BASE, FLA., USA	18	GAD	GARDEN, ALA., USA
19	ASP	GREENVILLE/SPRINGFIELD, SC, USA	20	GID	GREENVILLE, MISS., USA
21	GWD	GREENWOOD, MISS., USA	22	GHO	GREENWOOD, S.C., USA
23	GPT	GULFPORT/BILOXI, MISS., USA	24	HNG	HATTIESBURG, MISS., USA
25	HGV	HUNTSVILLE/DECATOR, ALA., USA	26	JAN	JACKSON/VICKSBURG, MISS., USA
27	MKL	JACKSON, TENN., USA	28	JAX	JACKSONVILLE, FLA., USA
29	TYS	KNOXVILLE, TENN., USA	30	LUL	LAFAYETTE, MISS., USA
31	MEM	MEMPHIS, TENN., USA	32	MTI	MERIDIAN, MISS., USA
33	MIA	MIAMI, FLA., USA	34	MOB	MOBILE, ALA., USA
35	MIL	MONTGOMERY, ALA., USA	36	MGR	MONTGOMERY, ALA., USA
37	MHG	MOULTRIE/THOMASVILLE, GA., USA	38	MSL	MUSCLE SHOALS, ALA., USA
39	BNA	NASHVILLE, TENN., USA	40	HEZ	NATCHEZ, MISS., USA
41	MRY	NEW ORLEANS, LA., USA	42	LGA	NEW YORK, NY-LA GUARDIA APRT., USA
43	ELW	NEW YORK, NY-NEWARK APRT., USA	44	MCO	ORLANDO, FLA., USA
45	PBN	PANAMA CITY, FLA., USA	46	SYI	SHELBYVILLE, TENN., USA
47	STC	ST. LOUIS, MO., USA	48	TLH	TALLAHASSEE, FLA., USA
49	TRI	TRI-CITY APRT., TENN., USA	50	TOP	TOPEKA, MISS., USA
51	TCL	TUSCALOOSA, ALA., USA	52	UDX	UNIVERSITY, MISS., USA
53	VLD	VALDOSTA, GA., USA	54	WDC	WASHINGTON, DC-WIRES APRT., USA

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381	IT	TEXAS	INTERNATIONAL AIRLINES, INC	
1	ABI	ABILENE, TEXAS, USA		2 ABO ABQUERQUE, N.M., USA.
3	ESF	ALEXANDRIA, LA., USA		4 AMA AMARILLO, TEXAS, USA
5	AUS	AUSTIN, TEXAS, USA		6 BTR BATON ROUGE, LA., USA
7	RPT	BELMONT/PT. ARTHUR, TEX., USA		8 HSA BIG SPRING, TEXAS, USA
9	BWD	BROWNSWOOD, TEXAS, USA		10 CNA CALIFORNIA, N.M., USA
11	CVN	CLOVIS, N.M., USA		12 CHP CORPUS CHRISTI, TEXAS, USA
13	DAL	DALLAS/FT. WORTH, TEXAS, USA		14 DEN DENVER, COLORADO, USA
15	ELU	EL DORADO/CARMEN, ARK., USA		16 ELP EL PASO, TEXAS, USA
17	HRL	HARLINGEN, TEXAS, USA		18 HOB HOBBS, N.M., USA
19	HOT	HOT SPRINGS, ARK., USA		20 IAH HOUSTON, TEXAS, USA
21	JAN	JACKSON/VICKSBURG, MISS., USA		22 JBR JONESBORO, ARK., USA
23	LFT	LAFAYETTE, LA., USA		24 LCH LAKE CHARLES, LA., USA
25	LDI	LAREDO, TEXAS, USA		26 LIT LITTLE ROCK, ARK., USA
27	GGG	LONGVIEW, TEXAS, USA		28 LAX LOS ANGELES, CALIF., USA
29	LBB	LUBBUCK, TEXAS, USA		30 LFK LUFKIN, TEXAS, USA
31	MFF	MC ALLEN, TEXAS, USA		32 MFM MEMPHIS, TENN., USA
33	MIX	MEXICO CITY, MEXICO		34 MAF MIDLAND, TEXAS, USA
35	MLU	MINHOE, LA., USA		36 MTY MONTERREY, MEXICO
37	MSY	NEW ORLEANS, LA., USA		38 PBF PINE BLUFF, ARK., USA
39	HW	ROSWELL, N.M., USA		40 SLC SALT LAKE CITY, UTAH, USA
41	SJT	SAN ANGELO, TEXAS, USA		42 SAT SAN ANTONIO, TEX., USA
43	SHV	SHREVEPORT, LA., USA		44 TPL TEMPLE, TEXAS, USA
45	TAK	TEXARKANA, ARK., USA		46 TYH TYLER, TEXAS, USA
47	ACT	WACO, TEXAS, USA		48 SPS WICHITA FALLS, TEXAS, USA
382	TH	THAI AIRWAYS COMPANY		
1	BAO	BAN MAK KHAENG, THAILAND		2 BKK BANGKOK, THAILAND
3	CNX	CHIANG MAI, THAILAND		4 CEI CHIANG RAI, THAILAND
5	KAC	KHON KAEN, THAILAND		6 CFT LAMPANG, THAILAND
7	LOE	LOEI, THAILAND		8 HGN MAE HONGSON, THAILAND
9	KDP	NAKHON PHANOM, THAILAND		10 NNF NAN, THAILAND
11	PTD	PHATTHANI, THAILAND		12 TEN PENANG, MALAYSIA
13	PRS	PHITSANULOK, THAILAND		14 HKI PHUKET, THAILAND
15	PLU	PIRAE, THAILAND		16 SNO SAKUN NAKHON, THAILAND
17	SGZ	SINGHAPURA, THAILAND		18 TAK TAK, THAILAND
19	TST	TRANG, THAILAND		20 UBQ UBOL, THAILAND
21	UTR	UTTARADIT, THAILAND		22 VTE VIENTIANE, LAOS
383	TG	THAI AIRWAYS INTERNATIONAL		
1	BKK	BANGKOK, THAILAND		2 CGU CALCUTTA, INDIA
3	CPR	COPENHAGEN, DENMARK		4 DAC DACCA, BANGLADESH
5	DEL	DELHI, INDIA		6 DPS DENPASAR, BALI, INDONESIA
7	HKG	HONG KONG, BR CROWN COLONY		8 JKT JAKARTA, JAVA, INDONESIA
9	KTM	KATHMANDU, NEPAL		10 KUL KUALA LUMPUR, MALAYSIA
11	MNL	MANILA, PHILIPPINE IS		12 OSA OSAKA, JAPAN
13	BWH	PENANG, MALAYSIA-BUTTERWORTH ARPT.		14 RGN RANGOON, BURMA
15	SGN	SAIGON, S VIETNAM		16 SIN SINGAPORE, SINGAPORE
17	SYD	SYDNEY, NSW AUSTRALIA		18 TPE TAIPEI, REP. OF CHINA (TAIWAN)

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U.S. REGIONAL AIRLINES
AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NORMAL MAX TEMP(°F)	EXISTING RUNWAY LENGTH(FT.) GRADIENT (SLOPES)	
							MAX	LENGTH(FT.) GRADIENT (SLOPES)
ABERDEEN	ABR	ABERDEEN MUNI.	S.D.	NC	1,301	86	6,900	.05
ABILENE	ABI	ABILENE MUNI.	TEXAS	TT	1,789	94	7,199	.39
AKRON/CANTON	CAK	AKRON-CANTON	OHIO	AL	1,228	83	6,398	.23
ALAMOGORDO	ALM	ALAMOGORDO MUNI	N.M.	FL	4,197	94	7,005	.80
ALAMOSA	ALS	ALAMOSA MUNI.	COLO.	FL	7,535	82	7,872	.05
ALBANY	ABY	ALBANY-DOUGHERTY CO.	GA.	SO	196	94	6,601	.10
ALBANY	ALB	ALBANY CO.	N.Y.	AL	288	84	6,000	.21
ALBUQUERQUE	ABQ	ALBUQUERQUE SUNPORT	N.M.	FL,TT	5,352	93	13,373	.16
ALEXANDRIA	ESF	ESLER FIELD	LA.	TT	108	95	5,999	.07
ALLENTOWN	ABE	ALLENTOWN-BETHLEHEM-EASTON	PA.	AL	388	85	6,185	.18
ALLIANCE	AIA	ALLIANCE MUNI	NEBR	FL	3,930	89	9,201	.05
ALPENA	APN	PHELPS COLLINS	MICH.	NC	689	70	9,000	.04
ALTOONA/MARTINSBURG	AOO	BLAIR CO.	PA.	AL	1,504	81	5,465	.67
AMARILLO	AMA	AMARILLO AIR TERMINAL	TEXAS	FL,TT	3,605	93	13,500	.03
ANDERSON	AND	ANDERSON CO.	S.C.	SO	782	92	5,001	.10
ANNISTON	ANB	ANNISTON-CALHOUN COUNTY	ALA.	SO	611	92	5,009	.34
APPLE VALLEY	APV	APPLE VALLEY/NEW	CALIF.	RW	3,059	99	6,498	1.5
ASHEVILLE	AVL	ASHEVILLE MUNI.	N.C.	PI	2,162	85	6,500	.78
ATHENS	AHN	ATHENS MUNI.	GA.	SO	807	91	4,992	.96
ATLANTA	ATL	W.B. HARTSFIELD ATLANTA INT.	G.A.	PI,SO	1,026	90	10,000	.55
ATLANTIC CITY	AIY	ATLANTIC CITY MUNI.	N.J.	AL	11	82	2,950	.04
ASTORIA	AST	CLATSOP	ORE.	RW	11	69	5,796	.05
AUGUSTA	AGS	BUSH FIELD	GA.	PI	145	93	8,000	.15
AUSTIN	AUS	ROBERT MUELLER MUNI.	TEXAS	TT	632	96	7,270	.77
BAKERSFIELD	BFL	MEADOWS FIELD	CALIF.	RW	491	102	6,708	.28
BALTIMORE	BAL	BALTIMORE-WASH. INTL.	MD.	PI,AL	146	85	9,500	.12
BARTLESVILLE	BVO	FRANK PHILLIPS	OKLA.	FL	715	95	6,200	.56
BATON ROUGE	BTR	RYAN	LA	TT,SO	70	92	6,000	.08
BEAUMONT/PORT ARTHUR	BPT	JEFFERSON CO.	TEXAS	TT	16	93	6,751	.12
BECKLEY	BKW	RALEIGH CO. MEM'L	W.VA.	PI	2,504	87	5,000	.44
BEMIDJI	BJI	BEMIDJI MUNI	MINN.	NC	1,389	79	5,700	.14
BENTON HARBOR	BEH	ROSS FIELD	MICH.	NC	643	82	5,107	.29
BIG SPRING	HCA	HOWARD CO.	TEXAS	TT	2,564	95	5,494	.62

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U.S. REGIONAL AIRLINES
AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NORMAL	EXISTING	GRADIENT
						MAX	RUNWAY LENGTH(FT)	
BILLINGS	BIL	LOGAN FIELD	MONT.	FL	3,606	87	8,600	.93
BINGHAMTON	BGM	BROOME CO.	N.Y.	AL	1,629	80	6,299	1.0
BIRMINGHAM	BHM	BIRMINGHAM MUNI.	ALA.	SO	643	91	10,000	.26
BISMARCK	BIS	BISMARCK MUNI.	N.D.	NC,FR	1,677	85	6,921	.18
BLOOMINGTON	BMI	BLOOMINGTON-NORMAL	ILL.	OZ	875	88	6,500	.09
BLOOMINGTON	BMG	MONROE CO.	IND.	AL	847	88	5,202	.12
BLYTHE	BLH	BLYTHE	CALIF.	RW	397	109	6,479	.03
BOISE	BOI	BOISE AIR TERMINAL	IDAHO	RW	2,858	90	8,993	.37
BOSTON	BOS	GEN'L E.L. LOGAN INT'L	MASS.	AL	19	82	10,080	.04
BOZEMAN	BZN	GALLATIN FIELD	MONT.	FL	4,458	76	9,000	.43
BRADFORD	BFD	BRADFORD REGIONAL	PA.	AL	2,143	83	6,499	.29
BRAINERD	BRD	BRAINERD-CROWN WING CO.	MINN.	NC	1,226	81	5,000	.03
BRIDGEPORT	BDR	IGOR SIKORSKI MEMORIAL	CONN.	AL	9	83	4,761	.04
BRISTOL	TRI	TRI CITY	TENN.	PI,SO	1,519	85	6,600	.44
BROOKINGS	BKK	BROOKINGS MUNI.	S.D.	NC	1,637	85	5,431	.41
BROWNWOOD	BWD	BROWNWOOD MUNI.	TEXAS	TT	1,386	98	5,598	.33
BUFFALO	BUF	GREATER BUFFALO INT'L	N.Y.	AL	723	70	8,100	.61
BURBANK	BUR	HOLLYWOOD-BURBANK	CALIF.	RW,PSA	775	88	6,955	1.24
BURLINGTON	BRL	BURLINGTON MUNI.	IOWA	OZ	697	87	6,702	.28
BURLINGTON	BTW	BURLINGTON INT'L	VT.	AL	335	82	7,807	.33
CAPE GIRARDEAU	CGI	CAPE GIRARDEAU MUNI.	MO.	OZ	342	91	6,499	.07
WILDWOOD	WND	CAPE MAY CO.	N.J.	AL	22	81	5,000	.05
CARLSBAD	CNM	CAVERN CITY AIR TRML	N.M.	TT	3,276	96	6,670	.54
CASPER	CPR	NATRONA CO. INT'L.	WYO	FL	5,348	90	9,061	.30
CEDAR CITY	CDC	CEDAR CITY MUNI.	UTAH	RW	5,622	90	6,100	.19
CEDAR RAPIDS	CID	CEDAR RAPIDS MUNI.	IOWA	OZ	863	87	7,000	.14
CHADRON	CDR	CHADRON MUNI.	NEBR.	FL	3,295	89	6,000	.49
CHAMPAIGN	CMI	U. OF ILL.-WILLARD	ILL.	OZ	754	86	6,500	.14
CHARLESTON	CRW	KANAWHA	W.VA.	PI,AL	982	87	6,303	.92
CHARLESTON	CHS	CHARLESTON AFB MUNI.	S.CAR.	PI,SO	45	89	9,000	.11
CHARLOTTE	CLT	DOUGLAS MUNI.	N.C.	PI,SO	748	88	7,845	.32
CHARLOTTESVILLE	CHO	CHARLOTTESVILLE-ALBERMARLE	VA.	PI	640	76	6,000	.32
CHATTANOOGA	CHA	LOVELL FIELD	TENN.	SO	682	90	7,400	.27

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CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NORMAL MAX	EXISTING RUNWAY	GRADIENT
						TEMP(°F)	LENGTH(FT)	(SLOPE)
CHEYENNE	CYS	CHEYENNE MUNI.	WYO.	FL	6,156	82	9,201	.59
CHICAGO	MDW	CHICAGO-MIDWAY	ILL.	OZ,NC,PI,SO,AL	619	84	6,519	.09
CHICAGO	ORD	CHICAGO O HARE INT'L	ILL.	OZ NC, AL	667	84	11,600	.14
CHICO	CIC	CHICO MUNI.	CALIF.	RW	238	98	6,722	.48
CINCINNATI	CVG	COVINGTON-CINCINNATI	OHIO	NC,PI,AL	890	85	9,501	.37
CLARKSBURG	CKB	BENEDUM	W.VA.	AL	1,203	86	5,200	.38
CLARKSVILLE	CKV	OUTLAW FIELD	TENN.	OZ	550	92	5,000	.50
CLEVELAND	CLE	CLEVELAND-HOPKINS INT'L	OHIO	NC,AL	792	83	9,000	.25
CLINTON	CWI	CLINTON MUNI	IOWA	OZ	707	87	5,204	.28
CLOVIS	CVN	CLOVIS MUNI.	N. MEX.	TT	4,214	91	5,690	.45
CODY	COD	CODY MUNI.	WYO.	FL	5,089	86	7,107	.31
COLLEGE STA.	CLL	EASTERWOOD FIELD	TEXAS	TT	319	97	5,161	.15
COLORADO SPRINGS	COS	PETERSON FIELD	COLO.	FL	6,172	84	11,013	1.19
COLUMBIA	COU	COLUMBIA REGIONAL	MO.	OZ	889	89	6,499	.11
COLUMBIA	CAE	COLUMBIA METRO.	S.C.	PI,SO	236	92	7,551	.27
COLUMBUS	CSG	COLUMBUS METRO.	GA.	SO	397	92	7,000	.14
COLUMBUS	GTR	GOLDEN TRIANGLE REGIONAL	MISS.	SO	263	93	6,497	.15
COLUMBUS	OLU	COLUMBUS MUNI.	NEBR.	FL	1,443	90	5,002	.07
COLUMBUS	CMH	PORT COLUMBUS INT'L	OHIO	NC,PI,AL	816	86	10,700	.10
CORPUS CHRISTI	CRP	CORPUS CHRISTI INT'L	TEXAS	TT	43	94	7,500	.05
CORTEZ	CEZ	CORTEZ-MONTEZUMA CO.	COLO.	FL	5,914	89	7,205	.13
CORVALLIS	CVD	CORVALLIS MUNI.	ORE.	RW	246	81	5,067	.12
CRESCENT CITY	CEC	JACK McNAMARA FIELD	CALIF.	RW	57	67	5,000	.14
DALLAS	DAL	DALLAS LOVE FIELD	TEXAS	OZ,FL,TT	487	95	8,800	.03
DANVILLE	DNV	VERMILION CO.	ILL.	AL	695	87	5,400	.82
DANVILLE	DAN	DANVILLE MUNI.	VA.	PI	582	87	5,000	.40
DAYTON	DAY	J.M. COX DAYTON MUNI.	OHIO	NC,AL	1,008	88	9,500	.02
DECATUR	DEC	DECATUR	ILL.	OZ	679	89	6,500	.07
DENVER	DEN	STAPLETON INT'L	COLO.	NC,FL,TT,OZ	5,331	87	11,500	.42
DES MOINES	DSM	DES MOINES MUNI.	IOWA	OZ	957	86	9,000	.51
DETROIT	DTW	DETROIT METRO. WAYNE CO.	MICH.	NC,AL	639	84	10,500	.02
DEVILS LAKE	DVL	DEVILS LAKE MUNI.	N.D.	NC	1,454	81	5509	.22
DOOTHAN	DHN	DOOTHAN	ALA.	SO	401	92	8,500	.64
DU BOIS	DUJ	DU BOIS-JEFFERSON CO.	PA.	AL	1,817	86	5,505	.45
DUBUQUE	DBQ	DUBUQUE MUNI.	IOWA	OZ	1,076	84	6,500	.24
DULUTH	DLU	DULUTH INT'L	MINN	NC	1,429	77	10,154	.05

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CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION (FT)	NORMAL	EXISTING	GRADIENT
						MAX TEMP (°F)	RUNWAY LENGTH (FT)	
EAU CLAIRE	EAU	EAU CLAIRE MUNI.	WISC.	NC	906	82	7,299	.30
EL CENTRO	IPL	IMPERIAL COUNTY	CALIF.	RW	-56	107	5,305	.05
ELDORADO/CAMDEN	ELD	GOODWIN FIELD	ARK.	TT	277	94	5,099	.24
EL PASO	ELP	EL PASO INT'L	TEXAS	FL,TT	3,956	95	12,103	.22
EGLIN	VPS	EGLIN AFB	FLA.	SO	85	89	12,000	.28
ELKINS	EKN	ELKINS-RANDOLPH CO.	W.VA	AL	1,987	78	4,542	1.04
ELMIRA	ELM	CHEMUNG CO.	N.Y.	AL	951	83	5,604	.22
ENID	WDG	ENID WOODRING MUNI.	OKLA.	FL	1,167	95	6,503	.35
EPRATA	EPH	EPRATA MUNI	WASH.	RW	1,272	90	7,300	.16
ERIE	ERI	ERIE INT'L	PA.	AL	732	80	6,000	.04
ESCANABA	ESC	DELTA CO.	MICH.	NC	609	75	6,498	.25
EUGENE	EUG	MAHLON SWEET FIELD	ORE.	RW	365	82	6,200	.09
EUREKA/ARCATA	ACV	ARCATA/EUREKA	CALIF.	RW	218	61	5,999	.66
EVANSVILLE	EVV	EVANSVILLE DRESS REG.	IND.	AL	418	92	8,021	.44
FAIRMONT	FRM	FAIRMONT MUNI.	MINN.	NC	1,161	84	5,002	.09
FARGO	FAR	HECTOR FIELD	N.D.	NC	900	84	9,151	.02
FARMINGTON	FMN	FARMINGTON MUNI.	N.M.	FL	5,503	92	6,700	.42
FAYETTEVILLE	FYV	DRAKE FIELD	ARK.	FL	1,251	90	6,006	.26
FLAGSTAFF	FLG	PULLIAM	ARIZ	FL	7,012	81	7,000	.26
FLINT	FNT	BISHOP	MICH.	NC	781	82	7,199	.02
FLORENCE	FLO	FLORENCE MUNI.	S.C.	PI	147	90	6,500	.38
FORT DODGE	FOD	FORT DODGE MUNI.	IOWA	OZ	1,162	87	4,400	.46
FORT LEONARD WOOD	TBN	FORNEY AAF	MO.	OZ,FL	11,57	88	5,037	.18
FORT SMITH	FSM	FORT SMITH MUNI.	ARK.	FL	468	95	8,000	.34
FRANKLIN	FKL	CHESS-LAMBERTON	PA.	AL	1,540	83	5,200	.25
FRESNO	FAT	FRESNO AIR TERMINAL	CALIF.	RW	332	99	9,218	.04
GADSDEN	GAD	GADSEN	ALA.	SO	564	92	4,815	.31
GALESBURG	GBG	GALESBURG MUNI.	ILL.	OZ	764	86	5,794	.18
GALLUP	GUP	SENATOR CLARKE FIELD	N.M.	FL	6,468	88	6,300	.17
GALVESTON	GLS	SCHOLES FIELD	TEXAS	TT	7	89	6,000	.03
GARDEN CITY	GCK	GARDEN CITY MUNI.	KAN	FL	2,895	94	6,000	.17
GLASGOW	GGW	GLASGOW INT'L	MONT.	FL	2,293	87	6,007	.15
GLENDIVE	GDV	DAWSON COMMUNITY	MONT.	FL	2,457	89	5,700	.10
GOLDSBORO	GSB	GOLDSBORO-WAYNE MUNI	N.C.	PI	133	92	3,698	0
GOODLAND	GLD	RENNER FLD./GOODLAND MUN	KAN	FL	3,657	92	5,550	.16

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CITY	CODE	NAME	STATE	USER AIRLINES	NORMAL MAX ELEVATION (FT)	EXISTING RUNWAY TEMP (°F)	GRADIENT LENGTH (FT) (SLOPE)
GRAND CANYON	GCN	GRAND CANYON NAT'L PARK	AIRZ.	RW	6,605	86	9,000 .81
GRAND FORKS	GFK	GRAND FORKS INT'L	N.D.	NC	843	83	7,350 .05
GRAND ISLAND	GRI	GRAND ISLAND AIR PARK	NEBR.	FL	1,846	91	7,189 .10
GRAND JUNCTION	GJT	WALKER FIELD	COLO.	FL	4,857	93	10,500 .34
GRAND RAPIDS	GRR	KENT CO.	MICH.	NC, AL	793	83	6,600 .06
GREAT FALLS	GTF	GREAT FALLS INT'L	MONT.	FL, RW	3,674	83	10,500 .18
GREEN BAY	GRB	AUSTIN-STRAUBEL FIELD	WISC.	NC	694	80	7,700 .17
GREENBRIER/LEWISBRG	LWD	GREENBRIER VALLEY	W.VA.	PI	2,301	85	6,000 .35
GREENSBORO	GSO	GREENSBORO-HIGH POINT	N.C.	PI	926	87	8,201 .18
GREENVILLE	GLH	GREENVILLE MUNI.	MISS.	SO	131	93	7,018 .04
GREENVILLE/SPARTANBR	GSP	GREENVILLE/SPARTANBURG	S.C.	PI	972	90	7,600 .20
GREENWOOD	GWO	GREENWOOD-LEFLORE	MISS.	SO	155	93	4,996 .10
GREENWOOD	GRD	GREENWOOD CO.	S.C.	SO	631	92	5,212 .27
GUADALAJARA	GDL	DON MIGUEL HIDALGO	MEXICO	RW	5,007	83	13,120
GULFPORT/BILOXI	GPT	GULFPORT MUNI.	MISS.	SO	28	91	9,000 .10
GUINNISON	GUC	GUINNISON COUNTY	COLO.	FL	7,660	83	7,200 .29
HAGERSTOWN	HGR	HAGERSTOWN REGIONAL	MD.	AL	704	87	5,449 .77
HANCOCK	CMX	HOUGHTON CO MEM'L	MICH	NC	1,091	75	6,500 .55
HARLINGTON	HRL	HARLINGTON INDUST. AIRPT.	TEXAS	TT	35	98	6,349 .03
HARRISBURG	MDT	HARRISBURG INT'L-OLMSTED	PA.	AL	308	36	8,010 .09
HARRISON	HRO	BOONE COUNTY	ARK.	FL	1,374	92	5,659 .27
HARTFORD	BDL	BRADLEY INT'L	CONN.	AL	173	83	9,501 .13
HASTINGS	HSI	HASTINGS MUNI.	NEBR.	FL	1954	91	5,600 .29
HAVRE	HVR	HAVRE CITY-CO.	MONT.	FL	2,584	85	5,200 .11
HATTIESBURG	HBG	HATTIESBURG MUNI.	MISS.	SO	151	93	6,219 .14
HAYS	HYS	HAYS MUNI.	KAN.	FL	1,998	93	5,700 .20
HAZLETON	HZL	HAZLETON MUNI.	PA.	AL	1604	80	4,900 .10
HIBBING	HIB	CHISHOLM-HIBBING	MINN.	NC	1,352	79	6,660 .22
HICKORY	HKY	HICKORY MUNI.	N.C.	PI	1,189	89	6,402 .83
HOBBS	HOB	LEA CO./HOBBS	N.M.	TT	3,659	95	7,399 .12
HOQUIAM	HQM	BOWERMAN	WASH.	RW	14	69	5,000 .04
HOT SPRINGS	HOT	MEMORIAL FIELD	ARK.	FL, TT	535	95	6,096 .57
HOUSTON	IAH	HOUSTON INT'L	TEXAS	TT	98	92	9,401 .04
HUNTINGTON	HTS	TRISTATE/WALKER-LONGFD.	W.VA.	PI, AL	828	88	5,281 0
HUNTSVILLE/DECATUR	HSV	HUNTSVILLE-MADISON JETPT.	ALA.	SO	629	92	8,000 .14
HURON	HON	W.W. HOWES MUNI	S.D.	N.C.	1,287	89	5,100 .08

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CITY	CODE	NAME	STATE	USERS AIRLINES	ELEVATION(FT)	NORMAL	EXISTING	GRADIENT
						MAX TEMP(°F)	RUNWAY LENGTH(FT)	
IDAHO FALLS	IDA	FANNING FIELD	IDAHO	RW	4,740	87	9,027	.21
INDIANOPOLIS	IND	INDIANOPOLIS MUNI.	IND.	AL,OZ	797	86	10,004	.32
INTERNATIONAL FALLS	INL	FALLS INTERNATIONAL	MINN.	NC	1,180	79	5,008	.31
INYOKERN	IYK	INYOKERN-KERN CO.	CALIF.	RW	2,457	103	7,315	.38
IRON MOUNTAIN	IMT	FORD	MICH.	NC	1,174	79	6,502	.70
IRONWOOD	IWD	GOGEBIC CO.	MICH.	NC	1,246	79	5,400	.08
ISLIP	ISP	ISLIP-MACARTHUR	N.Y.	AL	99	81	6,000	.17
ITHACA	ITH	TOMPKINS CO.	N.Y.	AL	1,099	84	5,801	.32
JACKSON	JXN	REYNOLDS MUNI.	MICH.	NC	1,000	84	5,278	.17
JACKSON/VICKSBURG	JAN	ALLEN C. THOMPSON FIELD	MISS.	SO,TT	345	93	8,500	.48
JACKSON	MKL	MCKELLAR FIELD	TENN.	SO	433	93	6,005	.42
JACKSON	JAC	JACKSONS HOLE	WYO	FL	6,444	82	6,305	.62
JACKSONVILLE	JAX	JACKSONVILLE INT'L	FLA	SO	29	92	8,000	.04
JACKSONVILLE	OAJ	ALBERT J. ELLIS	N.C.	PI	94	90	5,200	.05
JANESVILLE	JVL	ROCK CO.	WISC.	NC	808	85	6,701	.04
JOHNSTOWN	JST	JOHNSTOWN-CAMBRIA CO.	PA.	AL	2,284	82	5,488	.24
JONESBORO	JBR	JONESBORO MUNI.	ARK.	TT	261	93	5,599	.04
JOPLIN	JLN	JOPLIN MUNI	MO.	OZ,FL	980	91	6,505	.37
KALAMAZOO	AZO	KALAMAZOO MUNI.	MICH.	NC	874	85	5,300	.15
KALISPELL	FCA	GLACIER PARK INT'L	MONT.	RW	2,972	82	8,000	.18
KANSAS CITY	MCI	KANSAS CITY INT'L	MO.	OZ,NC,FL	1,025	91	10,801	.30
KEARNEY	EAR	KEARNEY MUNI.	NEBR.	FL	2,130	90	7,225	.04
KINSTON	ISO	STALLINGS FIELD	N.C.	PI	94	91	6,001	.14
KIRKSVILLE	IRK	CLARENCE CANNON MEM'L	MO.	OZ	966	87	6,004	.03
KLAMATH FALLS	LMT	KINGSLEY FIELD	ORE.	RW	4,092	85	10,300	.68
KNOXVILLE	TYS	MCGHEE TYSON	TENN.	PI,SO	981	90	9,000	.64
LA CROSSE	LSE	LA CROSSE MUNI	WISC.	NC	653	84	8,536	.09
LA PAZ	LAP	GEN. MANUEL MARQUEZ D.LE	MEXICO	RW	46	95	8,200	-
LAFAYETTE	LAF	PURDUE U.	IND.	AL	605	87	6,600	.09
LAFAYETTE	LFT	LAFAYETTE REGIONAL	LA.	TT	42	93	5,400	.10
LAKE CHARLES	LCH	LAKE CHARLES MUNI.	LA.	TT	16	92	6,500	.02
LAKE TAHOE	TVL	LAKE TAHOE	CALIF.	RW	6,264	75	8,544	.17
LAMAR	LAA	LAMAR MUNI	COLO.	FL	3,703	94	6,300	.45

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CITY	CODE	NAME	STATE	USER AIRLINED	ELEVATION(FT)	NORMAL	EXISTING	GRADIENT
						MAX TEMP(°F)	RUNWAY LENGTH(FT)	
LANCASTER	LNS	LANCASTER	PA	AL	403	87	5,398	.50
LANSING	LAN	CAPITAL REGION	MICH.	NC	859	81	6,500	.17
LARAMIE	LAR	GENERAL BREES FIELD	WYO.	FL	7,276	79	7,700	.12
LAS VEGAS	LAS	MC CARRAN INT'L	NEV.	FL,RW	2,171	104	12,545	1.03
LAUREL	LUL	LAUREL MUNI.	MISS.	SO	238	93	5,012	.10
LAWTON	LAW	LAWTON MUNI.	OKLA.	FL	1,109	98	6,000	.34
LEWISTON	LWS	LEWISTON-NEZ PERCE CO.	IDAHO	RW	1,438	93	6,512	.20
LEWISTON	LWT	LEWISTON MUNI.	MONT.	FL	4,165	82	5,630	.8
LEXINGTON	LEX	BLUE GRASS	KY.	PI,AL	979	86	6,500	.51
LIBERAL	LBL	LIBERAL MUNI.	KAN.	FL	2,887	95	7,100	.04
LIMA	LIA	LIMA	OHIO	AL	827	87	3,500	.08
LINCOLN	LNK	LINCOLN MUNI.	NEBR	FL	1,198	92	12,900	.29
LITTLE ROCK	LIT	ADAMS FIELD	ARK.	FL,TT	257	93	7,000	.06
LONDON	LOZ	CORBIN-LONDON WAR MEM'L	KY.	PI	1,212	86	6,002	.50
LONGVIEW	GGG	GREGG COUNTY	TEXAS	TT	365	97	10,000	.15
LAREDO	LOI	LAREDO INT'L	TEXAS	TT	539	99	7,700	.77
LOS ANGELES	LAX	LOS ANGELES INT'L	CALIF.	TT,RW,PSA	126	76	12,090	.28
LOUISVILLE	SDF	STANDIFORD FIELD	KY.	OZ,PI,AL	497	89	7,800	.38
LUBBOCK	LBB	LUBBOCK REGIONAL	TEXAS	TT	3,269	92	8,500	-
LUFKIN	LFK	ANGELINA CO.	TEXAS	TT	290	95	4,805	.30
LYNCHBURG	LYH	LYNCHBURG MUNI-RGLEN FLD	VA.	PI	942	86	5,800	.64
MADISON	MSN	TRUAX FIELD	WISC.	OZ,NC	859	85	7,621	.04
MANHATTAN	MHK	MANHATTAN MUNI.	KAN	FL	1,056	93	5,500	.13
MANISTEE	MBL	MANISTEE-BLACKER	MICH.	NC	620	80	5,502	.10
MANITOWOC	MTW	MANITOWOC MUNI.	WISC.	NC	651	79	5,000	.07
MANKATO	MKT	MANKATO MUNI.	MINN.	NC	1,020	83	5,400	.04
MANSFIELD	MFD	MANSFIELD LAHM MUNI.	OHIO	AL	1,297	87	9,000	.25
MARION	MWA	WILLIAMSON CO.	ILL	OZ	471	90	6,502	.23
MARQUETTE	MQT	MARQUETTE CO.	MICH.	NC	1,419	70	6,500	.23
MASON CITY	MCW	MASON CITY MUNI.	IOWA	OZ	1,213	83	6,504	.35
MASSENA	MSS	RICHARDS FIELD	N.Y.	AL	214	81	5,000	.23
MATTOON	MTO	COLES CO. MEMORIAL	ILL	OZ,AL	721	88	5,800	.18
MAZATLAN	MZT	GEN RAFAEL BUELNA	MEXICO	RW	16	91	8,856	-

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CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NORMAL MAX TEMP(°F)	EXISTING RUNWAY LENGTH(FT)	GRADIENT (SLOPE)
						90	92	.18
MCALLEN	MFE	MILLER INT'L	TEXAS	TT	107	90	6,204	.18
McCOOK	MCK	McCOOK MUNI.	NEBR.	FL	2,579	92	6,000	.55
MEDFORD	MFR	MEDFORD-JACKSON CO.	ORE.	RW	1,330	89	6,700	.54
MEMPHIS	MEM	MEMPHIS INT'L	TENN.	AL,FL,TT,SO,PI	331	91	9,320	.45
MENOMINEE	MNM	MENOMINEE CO.	MICH.	NC	621	75	5,110	.32
MERIDIAN	MEI	KEY FIELD	MISS.	SO	297	93	8,004	.08
MIAMI	MIA	MIAMI INT'L	FLA.	SO	9	90	10,500	0
MIDLAND	MAF	MIDLAND-ODESSA REGIONAL	TEXAS	TT	3,870	94	8,307	.17
MILES CITY	MLS	MILES CITY	MONT.	FL	2,628	90	6,313	.07
MILWAUKEE	MKE	GEN. MITCHEL FIELD	WISC.	NC,OZ	722	79	9,916	.41
MINNEAPOLIS/ST.PAUL	MSP	MINNEAPOLIS-ST PAUL INT'L	MINN.	OZ,NC,AL	840	84	10,000	.28
MINOT	MOT	MINOT INT'L	N.D.	NC,FL	1,715	81	6,276	.48
MISSOULA	MSO	JOHNSON-BELL FIELD	MONT.	FL	1,302	90	6,700	.11
MITCHELL	MHE	MITCHELL MUNI.	S.D.	NC	1,302	90	6,700	.11
MOBILE	MOB	BATES FIELD	ALA.	SO	218	91	6,800	.09
MOLINE	MLI	QUAD-CITY	ILL.	OZ	589	88	6,505	.12
MONROE	MLU	MONROE MUNI.	LA.	SO,TT	79	94	6,000	.05
MONTEREY	MRY	MONTEREY PENINSULA	CALIF.	RW	244	75	6,600	1.39
MONTERREY	MTY	MONTERREY INT'L	MEXICO	TT	1,474	-	6,596	.
MONTGOMERY	MGM	DANNELLY FIELD	ALA.	SO	221	92	9,000	.3
MONROSE	MTJ	MONROSE COUNTY	COLO.	FL	5,759	91	6,999	.76
MORGANTOWN	MGW	MORGANTOWN MUNI-W.L.B HT	W.VA.	AL	1,248	86	5,200	.15
MOULTRIE/THOMASVILLE	MGR	MOULTRIE-THOMASVILLE	GA.	SO	294	93	5,127	.49
MOUNT VERNON	MVN	MT VERNON-OUTLAND	ILL.	OZ	480	89	5,835	.05
MUNCIE	MIE	DELAWARE CO.-JOHNSON FLD	IND.	AL	937	87	5,156	.09
MUSCLE SHOALS	MSL	MUSCLE SHOALS	ALA.	SO	550	91	5,996	.18
MUSKEGON	MKG	MUSKEGON CO.	MICH.	NC	628	80	6,501	.08
MUSKOGEE	MKO	DAVIS FIELD	OKLA.	FL	610	95	7,200	.36
MYRTLE BEACH	CRE	MYRTLE BEACH	S.C.	PI	33	88	5,996	.04
NASHVILLE	BNA	NASHVILLE METRO.	TENN.	OZ,PI,AL,SO	597	91	8,000	.29
NATCHEZ	HEZ	HARDY-ANDERS FIELD	MISS.	SO	272	93	5,000	.20
NEWARK	EWR	NEWARK INT'L	N.J.	PI,AL,SO	18	84	9,800	.01
NEW BERN	EWN	SIMMONS NOTT	N.C.	PI	19	90	4,807	.06
NEW ORLEANS	MSY	NEW ORLEANS INT'L	LA.	TT,SO	4	91	9,227	.01
NEW YORK	JFK	J.F. KENNEDY INT'L	N.Y.	AL	12	85	14,572	0
NEW YORK	LGA	LA GUARDIA	N.Y.	NC,OZ,PI,AL,SO	21	85	7,000	.07

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U.S. REGIONAL AIRLINES
AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NORMAL MAX	EXISTING RUNWAY	GRADIENT
						TEMP (°F)	LENGTH(FT)	(SLOPE)
NEWPORT NEWS	PHF	PATRICK HENRY	VA.	PI, AL	41	86	8,003	.07
NORFOLK	OFK	KARL STEFAN MEM'L	NEBR.	NC	1,571	89	5,800	.36
NORFOLK	ORF	NORFOLK REGIONAL	VA.	RW	27	86	6,000	.12
NORTH BEND	OTH	NORTH BEND MUNI.	ORE.	RE	14	67	5,045	.09
NORTH PLATTE	LBF	LEE BIRD FIELD	NEBR.	FL	2,779	88	6,600	.09
OAKLAND	OAK	METROPOLITAN OAKLAND INT'L	CALIF.	RW, PSA, XK	6	74	10,000	.01
OGDENSBURG	OGS	OGDENSBURG INT'L	N.Y.	AL	297	81	5,200	.21
OKLAHOMA CITY	OKC	WILL ROGERS WORLD	OKLA.	FL	1,294	94	9,802	.13
OLYMPIA	OLM	OLYMPIA	WASH.	RW	205	80	5,974	.24
OMAHA	OMA	EPPLEY AIRFIELD	NEBR.	NC, OZ, FL	983	90	8,501	.07
ONTARIO	ONT	ONTARIO INT'L	CALIF.	RW	952	91	9,982	.16
ONTARIO	ONO	ONTARIO MUNI	ORE.	RE	2,189	96	4,531	.09
ORLANDO	MCO	MCCOY AFB	FLA.	SO	96	92	12,000	.01
OSHKOSH	OSH	WITTMAN FIELD	WISC.	NC	795	84	6,700	.23
OTTUMWA	OTM	OTTUMWA INDUSTRIAL	IOWA	OZ	845	86	6,500	.16
OWENSBORO	OWB	OWENSBORO-DAVIESS CO.	KY.	OZ	407	90	6,498	.12
OXNARD	OXR	VENTURA CO.	CALIF.	RW	43	75	5,950	.19
PADUCAH	PAH	BARKLEY	KY.	OZ	410	92	6,504	.46
PAGE	PGA	PAGE	ARIZ	RW	4,310	97	5,499	1.22
PALM SPRINGS	PSP	PALMS SPRINGS MUNI.	CALIF	RW, XK	448	109	7,004	.76
PALMDALE	PMD	PALMDALE	CALIF.	RW	2,542	100	12,002	.28
PANAMA CITY	PFN	PANAMA CITY-BAY CO.	FLA.	SO	20	88	6,004	.18
PARIS	PRX	COX FIELD	TEXAS	FL	547	95	4,624	.17
PARKERSBURG	PKB	WOOD CO.AIRPORT G.R. WLS	FDW.VA.	PI, AL	858	86	5,100	.73
PARSONS	PPF	TRI CITY	KAN.	FL	899	93	5,687	.60
PASCAGOUOLA	MOB	MOBILE ALABAMA	SO					
PASCO	PSC	TRI-CITY	WASH.	RW	406	92	5,804	.12
PASO ROBLES	PRB	PASO ROBLES MUNI	CALIF	RW	836	95	6,009	.18
PELLSTON	PLN	EMMET CO.	MICH.	NC	720	79	6,513	.13
PEORIA	PIA	GREATER PEORIA	ILL.	OZ	660	86	7,000	.37
PHILADELPHIA	PHL	PHILADELPHIA INT'L	PA.	AL	23	88	10,500	.12
PHILADELPHIA	PNE	NORTH PHILADELPHIA	PA	AL	120	85	7,000	.10
PHILIPSBURG	PSB	MID-STATE	PA.	AL	1,948	79	5,711	.66

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U.S. REGIONAL AIRLINES
AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USERS AIRLINES	NORMAL MAX ELEVATION(FT)	EXISTING RUNWAY TEMP(°F)	GRADIENT LENGTH(FT)(SLOPE)
PHOENIX	PHX	PHOENIX SKY HARBOR INT'L	ARIZ	FL,RW	1,128	106	10,300 .15
PIERRE	PIR	PIERRE MUNI.	S.D.	NC	1,742	89	6,894 .13
PINE BLUFF	PBF	GRIDER FIELD	ARK.	TT	206	94	5,100 .1
PITTSBURGH	PIT	GREATER PITTSBURGH INT'L	PA.	AL	1,203	83	10,500 .38
PLATTSBURGH	PLB	CLINTON CO.	N.Y.	AL	371	82	5,000 .40
POCATELLO	PIH	POCATELLO MUNI	IDAHO	RE	4,448	89	8,347 .1
PONCA CITY	PNC	PONCA CITY MUNI	OKLA.	FL	1,007	95	4,800 .13
PORTLAND	PDX	PORTLAND INT'L	ORE.	RE	26	79	8,800 .02
PROVIDENCE	PVD	THEODORE F. GREE STATE	R.I.	AL	56	82	6,465 .12
PUERTO VALLARTA	PVR	LIC. GUSTAVO DIAZ ORDAZ	MEX.	RW	10	79	9,020 .
PUEBLO	PUB	PUEBLO MEMORIAL	COLO.	FL	4,726	92	10,497 .23
PULLMAN	PUW	PULLMAN/MOSCOW REGIONAL	WASH.	RW	2,551	83	6,731 .40
QUINCY	UIN	QUINCY MUNI-BALDWIN FLD.	ILL.	OZ	769	86	7,098 .08
RALEIGH/DURHAM	RDU	RALEIGH-DURHAM	N.C.	PI	436	90	7,500 .48
RAPID CITY	RAP	RAPID CITY REGIONAL	S.D.	NC,FL	3,182	88	7,422 .56
READING	RDG	READING MUNI.	PA.	AL	343	85	6,350 .19
REDDING	RDD	REDDING MUNI	CALIF.	RW	500	85	6,996 .36
REDMOND	RDM	ROBERTS FIELD	ORE.	RW	3,077	85	6,996 .36
RENO	RNO	RENO INT'L	NEV.	RW	4,411	92	9,000 .13
RHINELANDER	RHI	RHINELANDER-ONEIDA CO.	WISC.	NC	1,608	80	5,600 .16
RICHMOND	RIC	RICHMOND EVELYN BYRD INT	VA.	PI	168	87	9,000 .09
RIVERTON	RIW	RIVERTON MUNI.	WYO.	FL	5,509	89	7,621 1.0
ROANOKE	ROA	ROANOKE MUNI.	VA.	PI	1,175	86	5,900 .31
ROCHESTER	RST	ROCHESTER MUNI.	MINN.	OZ,NC	1,316	84	7,534 .40
ROCHESTER	ROC	ROCHESTER-MONROE CO.	N.Y.	AL	560	83	8,000 .41
ROCK SPRING	RKS	ROCK SPRINGS-SWEETWATER	WYO.	FL	6,747	83	6,688 .28
ROCKFORD	RFD	GREATER ROCKFORD	ILL.	OZ	736	85	8,198 .33
ROCKY MOUNT/WILSON	RWI	ROCKY MOUNT-WILSON	N.C.	PI	158	91	5,999 .16
ROSWELL	ROW	ROSWELL INDUSTRIAL AIR C	N.M.	TT	3,669	93	13,00 .30
RUTLAND	RUT	RUTLAND STATE	VT.	AL	787	80	5,000 .24
SCRAMENTO	SMF	SCRAMENTO METRO.	CALIF	RW,PSA,XK	23	92	8,600 .03
SAGINAW	MBS	TRI CITY	MICH.	NC	667	83	6,501 .20
ST. LOUIS	STL	LAMBERT-ST LOUIS INT'L	MO.	OZ,AL,FL,SO	589	90	10,018 .41
SALINA	SLN	SALINA MUNI	KAN.	FL	1,272	94	13,331 .19
SALISBURY	SBY	SALISBURY-WICOMICO CO.	MD.	AL	51	77	5,500 .14
SALT LAKE CITY	SLC	SALT LAKE CITY INT'L	UTAH	FL,TT,RW	4,226	92	10,000 .09

U.S. REGIONAL AIRLINES
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CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NORMAL MAX TEMP(°F)	EXISTING RUNWAY LENGTH(FT)	GRADIENT (SLOPE)
SAN ANGELO	SJT	MATHIS FIELD	TEXAS	TT	1,915	98	6,920	.32
SAN ANTONIO	SAT	SAN ANTONIO INT'L	TEXAS	TT	809	94	8,500	.35
SAN FRANCISCO	SFO	SAN FRANCISCO INT'L	CALIF.	RW,PSA,XK	10	74	10,600	.06
SAN JOSE	SJC	SAN JOSE MUNI	CALIF.	RW,PSA,XK	56	81	8,900	.29
SANTA ANA	SNA	ORANGE CO.	CALIF.	RW,XK	54	86	5,700	.28
SANTA BARBARA	SBA	SANTA BARBARA MUNI	CALIF.	RW	10	74	6,048	.02
SANTA FE	SAF	SANTA FE CO. MUNI.	N.M.	FL	6,344	85	8,322	.81
SANTA ROSA	STS	SONOMA CO.	CALIF.	RW	125	81	5,003	.16
SARINAC LAKE	SLK	ADIRONDACK	N.Y.	AL	1,659	77	5,000	.33
SAULT ST. MARIE	SSM	SAULT STE MARIE MUNI.	MICH.	NC	720	75	5,000	.41
SCOTTSBLUFF	BFF	SCOTTSBLUFF CO.	NEBR.	FL	3,965	90	8,280	.22
SEATTLE	SEA	SEATTLE-TACOMA INT'L	WASH.	RW	428	76	11,900	.72
SHELBYVILLE	SYI	SHELBYVILLE MUNI-BO MAR	TENN.	SO	800	89	5,003	.15
SHREVEPORT	SHV	SHREVEPORT REGIONAL	LA.	TT	257	94	7,300	.55
SIDNEY	SDY	SIDNEY-RICHLAND MUNI.	MONT.	FL	1,983	84	5,705	.11
SILVER CITY	SVC	SILVER CITY & GRANT CO.	N.M.	FL	5,443	89	6,408	.19
SIOUX CITY	SUX	SIOUX CITY MUNI.	IOWA	NC, OZ	1,097	87	9,000	.09
SOUTH BEND	SBN	ST. JOSEPT CO.	IND.	NC, AL	785	84	6,000	.23
SPOKANE	GEG	SPOKANE INT'L	WASH.	RW	2,372	82	9,000	.61
SPRINGFIELD	SPI	CAPITAL	ILL.	OZ	597	84	7,999	.13
SPRINGFIELD	SGF	SPRINGFIELD MUNI.	MO.	OZ	1,267	88	6,500	.10
PHILIPSBURG	PSB	MID-STATE	PA.	AL	1,948	79	5,711	.66
STAUNTON	SHD	SHENANDOAH VALLEY	VA.	PI	1,201	74	6,002	.42
STERLING	SQI	WHITESIDE CO.	ILL.	OZ	647	88	6,501	.09
STILLWATER	SWO	SEARCY FIELD	OKLA.	FL	984	95	5,000	.3
STOCKTON	SCK	STOCKTON METRO.	CALIF.	RW,PSA	29	93	8,650	.05
SYRACUSE	SYR	SYRACUSE HANCOCK INT'L	N.Y.	AL	421	83	9,005	.22
TALLAHASSEE	TLH	TALLAHASSEE MUNI.	FLA.	SO	81	91	6,071	.39
TEMPLE	TPL	DRAUGHON-MILLER MUNI	TEXAS	TT	682	97	6,300	.22
TERRE HAUTE	HUF	HULMAN FIELD	IND.	AL	585	88	9,025	.12
TEXARKANA	TXK	TEXARKANA MUNI.	ARK.	TT	389	95	6,601	.72
THIEF RIVER FALLS	TVF	THIEF RIVER FALLS MUNI.	MINN	NC	1,116	80	5,100	.03
THUNDER BAY	YQT		ONT.	NC	653		6,200	
TOLEDO	TOL	TOLEDO EXPRESS	OHIO	AL	684	84	8,700	.11
TOPEKA	TOP	PHILIP BILLARD MUNI.	KAN	FL	880	90	5,100	.10
TORONTO	YYZ	TORONTO INT'L	ONT.	NC, AL	10	73	11,050	.23

U.S. REGIONAL AIRLINES
AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NORMAL	EXISTING	GRADIENT
						MAX TEMP(F°)	RUNWAY LENGTH(FT)	
TRVERSE CITY	TVC	CHERRY CAPITAL	MICH.	NC	624	80	6,500	.28
TRENTON	TTN	MERCER CO.	N.J.	AL	213	84	5,999	.49
TUCSON	TUS	TUCSON INT'L	ARIZ	FL,RW	2,630	99	12,000	.63
TULSA	TUL	TULSA INT'L	OKLA.	OZ,FR	676	93	10,000	.23
TUPELO	TUP	C.D. LEMONS MUNI.	MISS.	SO	361	92	42,00	.17
TUSCALOOSA	TCL	TUSCALOOSA MUNI.	ALA.	SO	169	93	6,499	.17
TWINS FALLS	TWF	TWIN FALLS CITY-CO	IDAHO	RW	4,150	89	7,149	.17
TYLER	TYR	POUNDS FIELD	TEXAS	TT	544	96	5,200	.56
OXFORD	UOX	UNIVERSITY-OXFORD	MISS.	SO	451	92	4,700	.81
UTICA	UCA	ONEIDA CO.	N.Y.	AL	742	85	6,000	.56
VALDOSTA	VLD	VALDOSTA MUNI.	GA.	SO	204	92	5,600	.13
VERNAL	VEL	VERNAL	UTAH	FL	5,281	89	6,605	.20
VICTORIA	VCT	VICTORIA CO-FOSTER	TEXAS	TT	115	93	10,331	.12
WACO	ACT	WACO MUNI.	TEXAS	TT	516	97	6,597	.15
WALLA WALLA	ALW	WALLA WALLA CITY CO.	WASH.	RW	1,205	91	7,188	.64
WENATCHEE	EAT	PANGBORN FIELD	WASH.	RW	1,245	88	5,500	.30
B-14	DCA	WASHINGTON NATIONAL	D.C.	PI,AL	15	87	6,870	.03
WASHINGTON	IAD	DULLES INT'L	DC.	OZ,PI,SO	313	87	11,500	.16
WATERLOO	ALO	WATERLOO MUNI.	IOWA	OZ	873	85	8,400	.08
WATERTOWN	ART	WATERTOWN N.Y. INT'L	N.Y.	AL	325	80	5,000	.26
WATERTOWN	ATY	WATERTOWN MUNI.	S.D.	NC	1,748	83	6,899	.19
WAUSAU/MOSINEE	CWA	CENTRAL WISCONSIN	WISC.	NC	1,274	80	6,699	.24
WHITE PLAINS	HPN	WESTCHESTER CO.	N.Y.	AL	439	85	6,550	.06
WICHITA	ICT	WICHITA MUNI.	KAN.	FL	1,332	93	7,300	.01
WILKES-BARRE	AVP	WILKES-BARRE-SCRANTON	PA.	AL	956	83	6,450	.70
WILLIAMSPORT	IPT	WILLIAMSPORT-LYCOMING CO.PA	AL.		529	85	6,449	.19
WILLISTON	ISN	SLOULIN FIELD INT'L	N.D.	FL	1,957	86	6,041	1.25
WILMINGTON	ILG	GREATER WILMINGTON	DE.	AL	79	86	7,200	.14
WILMINGTON	ILM	NEW HANOVER CO.	N.C.	PI	31	89	8,000	.11
WINSLOW	INW	WINSLOW MUNI.	ARIZ.	FL	4,938	97	7,500	.80
WINSTON SALEM	INT	SMITH REYNOLDS	N.C.	PI	940		6,654	1.0
WOLF POINT	OLF	WOLF POINT INT'L	MONT.	FL	1,985	88	5,100	.04
WORCHESTER	ORH	WORCHESTER MUNI.	HASS.	AL	1,009	80	7,005	.36
WORLAND	WRL	WORLAND MUNI.	WYO	FL	4,245	90	7,004	.93

U.S. REGIONAL AIRLINES
AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	ELEVATION(FT)	NROMAL MAX TEMP(°F)	EXISTING RUNWAY LENGTH(FT)	GRADIENT (SLOPE)
WORTHINGTON	OTG	WORTHINGTON MUNI.	MINN.	NC	1,574	83	5,000	.14
YAKIMA	YKM	YAKIMA AIR TERMINAL	WASH.	RW	1,089	87	6,607	.68
YANKTON	YKN	CHAN GURNEY MUNI.	S.D.	NC	1,303	88	5,400	.62
YOUNGSTOWN	YNG	YOUNGSTOWN MUNI.	OHIO	AL	1,196	83	7,493	.88
YUMA	YUM	YUMA MCAS/YUMA INT'L	ARIZ.	RW	213	107	13,300	.07
BLUEFIELD	BLF	MERCER CO.	W.VA.	PI	2,857	87	4,743	.30
CALGARY	YYC	CALGARY INT'L	ALTA.	RW	3,557	66	12,700	.11
CROSSVILLE	CSV	CROSSVILLE MEMORIAL	TENN.	SO	1,881	85	5,419	.28
GLENS FALLS	GFL	WARREN CO.	N.Y.	AL	328	88	5,007	.10
JAMES TOWN	JHW	CHAUTAUQUA CO.	N.Y.	AL	1,723	83	5,300	.25
KEENE	EEN	DILLANT-HOPKINS	N.H.	AL	487	82	6,502	.27
KINGMAN	IGM	KINGMAN MUNI	ARIZ.	RW	3,446	98	6,830	.25
LAKE HAVASU CITY	LHU	LAKE HAVASU CITY	ARIZ.	RW	482	108	6,434	.05
LAKE OF THE OZARKS	AIZ	KAISER/LAKE OZARK	MO.	OZ	869	91	6,500	.09
MEXICO CITY	MEX	LIC. BENITO JUAREZ	MEXICO	TT	7,340	73	10,824	.
MONTRÉAL	YUL	MONTRÉAL INT'L	QUE	AL	117	73	11,000	.09
NEW HAVEN	HVN	TWEED-NEW HAVEN	CONN.	AL	13	81	5,600	.16
NEW LONDON	GON	TRUMBULL	CONN.	AL	10	81	5,000	.04
SAN DIEGO	SAN	SAN DIEGO INT'L	CALIF.	RW, PSA, XK	15	77	9,400	.02
HAYDEN	HDN	YAMPA VALLEY	COLO	FL	6,595	86	7,000	.02
WEST YELLOWSTONE	WYS	YELLOWSTONE ARPT	MONT	FL	5,644	80	8,401	.17

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U.S. REGIONAL AIRLINES
CORRECTED AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	EXISTING RUNWAY LENGTH (FT)	CORRECTED LENGTH (85% RELIABILITY)(FT)
ALAMOSA	ALS	ALAMOSA, MUNI	COLO	FL	7,872	4,349
ALTOONA/MARTINSBURG	A00	BLAIR CO.	PA	AL	5,465	4,225
ANDERSON	AND	ANDERSON CO.	S.C.	SO	5,001	4,122
ANNISTON	ANB	ANNISTON-CALHOUN CO.	ALA	SO	5,009	4,126
APPLE VALLEY	APV	APPLE VALLEY NEW	CAL	RW	6,498	3,929
ATHENS	AHN	ATHENS MUNI	GA	SO	4,992	3,817
BECKLEY	BKW	RALEIGH CO. MEM'L	W. VA.	PI	5,000	3,607
BENTON HARBOR	BEH	ROSS FIELD	MICH	NC	5,107	4,412
BIG SPRING	HCA	HOWARD CO.	TEX	TT	5,494	3,731
BLOOMINGTON	BMG	MONROE CO.	IND	AL	5,202	4,361
BRAINERD	BRD	BRAINERD-CROW WING CO.	MINN	NC	5,000	4,283
BRIDGEPORT	BDR	IGOR SIKORSKI MEM'L	CONN	AL	4,761	4,423
BROOKINGS	BKX	BROOKINGS MUNI	S.D.	NC	5,431	4,258
BROWNWOOD	BWD	BROWNWOOD MUNI	TEXAS	TT	5,598	4,223
CEDAR CITY	CDC	CEDAR CITY MUNI	UTAH	RW	6,100	3,506
CHADRON	CDR	CHADRON MUNI	NEB	FL	6,000	4,063
CLARKSBURG	CKB	BENEDUM	W. VA.	AL	5,200	4,460
CLARKSVILLE	CKV	OUTLAW FIELD	TENN	OZ	5,000	4,058
CODY	COD	CODY MUNI	WYO	FL	7,107	4,360
COLLEGE STATION	CLL	EASTWOOD FIELD	TEX	TT	5,161	4,341
COLUMBUS	OLU	COLUMBUS MUNI	NEB	FL	5,002	4,025
CORTEZ	CEZ	CORTEZ-MONTEZUMA CO.	COLO	FL	7,205	4,279
DANVILLE	DNV	VERMILLION CO.	ILL	AL	5,400	4,278
DANVILLE	DAN	DANVILLE MUNI	VA	PL	5,000	4,123
DUBOIS	DUJ	DUBOIS-JEFFERSON CO.	PA	AL	5,505	4,419
DURANGO	DRO	DURANGO-LA PLATA CO.	COLO	FL	8,000	4,244
ELDORADO/CAMDEN	ELD	GOODWIN FIELD	ARK	TT	5,099	4,304
ELKINS	EKN	ELKINS-RANDOLPH CO.	W. VA.	AL	4,542	3,282
FAIRMONT	FRM	FAIRMONT MUNI	MINN	NC	5,002	4,146
FLAGSTAFF	FLG	PULLIAM	ARIZ	FL	7,000	3,895
FORT DODGE	FOD	FORT DODGE MUNI	IOWA	OZ	4,400	3,534

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U.S. REGIONAL AIRLINES
CORRECTED AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	EXISTING RUNWAY LENGTH (FT)	CORRECTED LENGTH (85% RELIABILITY) (FT)
FORT LEONARDWOOD	TBN	FORNEY AAF	MO	OZ,FL	5,037	4,085
FRANKLIN	FKL	CHESS-LAMBERTON	PA	AL	5,200	4,154
GADSDEN	GAD	GADSDEN	ALA	SO	4,815	3,993
GARDEN CITY	GCK	GARDEN CITY MUNI	KAN	FL	6,000	4,241
GLENDIVE	GDV	DAWSON COMMUNITY	MONT	FL	5,700	4,266
GOLDSBORO	GSB	GOLDBORO-WANE MUNI	NC	PI	3,698	3,310
GOODLAND	GLD	RENNERFIELD/GOODLAND MUNI	KAN	FL	5,500	3,683
GREENBRIER/LEWISBURG	LWD	GREENBRIER VALLEY	W. VA.	PL	6,000	4,395
GREENWOOD	GWO	GREENWOOD-LE FLORE	MISS	SO	4,996	4,301
GREENWOOD	GRD	GREENWOOD CO.	SC	SO	5,212	4,296
GUNNISON	GUC	GUNNISON CO.	COLO	FL	7,200	3,869
HASTINGS	HSI	HASTINGS MUNI	NEBR	FL	5,600	4,200
HAVRE	HVR	HAVRE CITY CO.	MONT	FL	5,200	3,920
HAYS	HYS	HAYS MUNI	KAN	FL	5,700	4,298
HAZLETON	HZL	HAZLETON MUNI	PA	AL	4,900	4,398
HOT SPRINGS	HSP	INGALLS FIELD	VA	PI	5,602	3,706
HUNTINGTON	HTS	TRI-STATE/WALKER-LONG FIELD	W. VA	PI,AL	5,281	4,498
HURON	HON	W.W. HOWES MUNI	S.D.	NC	5,100	4,227
INTERNATIONAL FALLS	INL	FALLS INTERNATIONAL	MINN	NC	5,008	4,289
JACKSON	JXN	REYNOLDS MUNI	MICH	NC	5,278	4,459
JACKSON	JAC	JACKSONS HOLE	WYO	FL	6,305	3,589
JOHNSTOWN	JST	JOHNSTOWN-CAMBRIA CO.	PA	AL	5,488	4,123
KALAMAZOO	AZO	KALAMAZOO MUNI	MICH	NC	5,300	4,491
LAMAR	LAA	LAMAR MUNI	COLO	FL	6,300	4,071
LARAMIE	LAR	GENERAL BREES FIELD	WYO	FL	7,700	4,328
LAUREL	LUL	LAUREL MUNI	MISS	SO	5,012	4,303
LEWISTON	LWT	LEWISTON MUNI	MONT	FL	5,630	3,558
LIMA	LIA	LIMA	OHIO	AL	3,500	3,025
LUFKIN	LFK	ANGELINA CO.	TEXAS	TT	4,805	3,940
MANHATTAN	MHK	MANHATTAN MUNI	KAN	FL	5,500	4,459
MANITOWOC	MTW	MANITOWOC MUNI	WISC	NC	5,000	4,432
MC COOK	MCK	MC COOK MUNI	NEBR	FL	6,000	4,222
MENOMINEE	MNM	MENOMINEE CO.	MICH	NC	5,110	4,472
MONROSE	MTJ	MONROSE CO.	COLO.	FL	6,999	3,936

U.S. REGIONAL AIRLINES
CORRECTED AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	EXISTING RUNWAY LENGTH (FT)	CORRECTED LENGTH (85% RELIABILITY)(FT)
MORGANTOWN	MGW	MORGANTOWN MUNI-W.L.S. HART	W. VA	AL	5,200	4,275
MOULTRIE/THOMASVILLE	MGR	MOULTRIE-THOMASVILLE	GA	SO	5,127	4,237
MUNCIE	MIE	DELAWARE CO.-JOHNSON FLD.	IND	AL	5,156	4,333
NATCHEZ	HEZ	HARDY-ANDERS FLD.	MISS	SO	5,000	4,220
NEW BERN	EWN	SIMMONS NOTT	N.C.	PI	4,807	4,279
ONTARIO	ONO	ONTARIO MUNI	ORE	RW	4,531	3,450
PAGE	PGA	PAGE	ARIZ	RW	5,499	3,341
PARIS	PRX	COX FIELD	TEXAS	FL	4,624	3,810
PARKERSBURG	PKB	WOOD CO.-G.R. WILSON FIELD	W. VA.	PI, AL	5,100	4,180
PARSONS	PPF	TRI CITY	KAN.	FL	5,687	4,483
PHILIPSBURG	PSB	MID-STATE	PA	AL	5,711	4,268
PINE BLUFF	PBF	GRIDER FIELD	ARK	TT	5,100	4,430
PLATTSBURGH	PLB	CLINTON CO.	N.Y.	AL	5,000	4,414
PONCA CITY	PNC	PONCA CITY MUNI	OKLA	FL	4,800	3,839
RIVERTON	RIW	RIVERTON MUNI	WYO	FL	7,621	4,317
ROCK SPRINGS	RKS	ROCK SPRINGS-SWEETWATER CO.	WYO	FL	6,688	3,824
RUTLAND	RUT	RUTLAND STATE	VT	AL	5,000	4,329
SANTA ROSA	STS	SONOMA CO.	CALIF	RW	5,003	4,170
SARINAC LAKE	SLK	ADIRONDAK	NY	AL	5,000	4,036
SAULT ST. MARIE	SSM	SAULT ST. MARIE MUNI	MICH	NC	5,000	4,406
SHELBYVILLE	SYI	SHELBYVILLE MUNI	TENN	SO	5,003	4,115
SIDNEY	SDY	SIDNEY-RICHLAND MUNI	MONT	FL	5,705	4,422
SIDNEY	SNY	SIDNEY MUNI	NEBR	FL	6,600	4,210
STILLWATER	SWO	SEARCY FIELD	OKLA	FL	5,000	3,941
THIEF RIVER FALLS	TVF	THIEF RIVER FALLS MUNI	MINN	NC	5,100	4,471
TOPEKA	TOP	PHILIP BILLARD MUNI	KAN	FL	5,100	4,207
TUPELO	TUP	C.D. LEMONS MUNI	MISS	SO	4,200	3,530
TYLER	TYR	POUNDS FIELD	TEXAS	TT	5,200	4,144
OXFORD	UOX	UNIVERSITY-OXFORD	MISS	SO	4,700	3,687
VERNAL	VEL	VERNAL	UTAH	FL	6,605	4,027
WENATCHEE	EAT	PANGBORN FIELD	WASH	RW	5,500	4,456
WATERTOWN	ART	WATERTOWN N.Y.	NY	AL	5,000	4,290
WILLISTON	ISN	SLOULIN FIELD INT'L	ND	FL	6,041	4,394
WINSLOW	INW	WINSLOW MUNI	ARIZ	FL	7,500	4,344
WOLF POINT	OLF	WOLF POINT	MONT	FL	5,100	4,053

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U.S. REGIONAL AIRLINES
CORRECTED AIRPORT DATA
(1972)

CITY	CODE	NAME	STATE	USER AIRLINES	EXISTING RUNWAY LENGTH (FT)	CORRECTED LENGTH (85% RELIABILITY)(FT)
WORLAND	WRL	WORLAND MUNI	WYO	FL	7,004	4,293
YANKTON	YKN	CHAN GURNEY MUNI	SD	NC	5,400	4,282
BLUEFIELD	BLF	MERCER CO.	W. VA.	PI	4,743	3,363
CROSSVILLE	CSV	CROSSVILLE MEM'L	TENN	SO	5,419	4,128
JAMESTOWN	JHW	CHAUTAUQUA CO.	NY	AL	5,300	4,192
HAYDEN	HDN	YAMPA VALLEY	COLO	FL	7,000	4,000

APPENDIX C - ECONOMICS

C.1 COMMERCIAL AIRCRAFT PRODUCTION AND DEVELOPMENT COST ESTIMATES

Table C-1, "Basepoint Design Aircraft Cost Estimates", lists the essential input factors to the CAPDEC on the first page. Also shown are estimates of components of the development cost and the total amount in millions of dollars. The data shown are for the 50 passenger, 850 nautical mile range basepoint aircraft created in the design study phase. The second page presents unit, cumulative and average costs as a function of numbers of aircraft produced. The 400th pricing unit is underlined.

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JR JET - SEPTEMBER 12
RUN 4

TABLE C-1
BASEPOINT DESIGN AIRCRAFT COST ESTIMATES

USER	INITIALIZED	INPUT	DATA	
USER	PARAMETRIC	INPUT	DATA	
26 MFG WT EMPTY - 1000 LB	= 26.685	27 ROLLING ASSEMBLY WT - 1000 LB (4)	= 0.765	
29 WEIGHT PER ENGINE	= 1.685	32 AVIONICS FLAG (3)	= 0.0	
33 AVIONICS WEIGHT - 1000 LB (11)	= 0.436	34 AVIONICS COST - \$M (11,14)	= 0.125	
37 HIGH SPEED CRUISE (MACH NO)	= 0.680	18 HOURLY COST ESCAL. PERCENT/YR (9,13)	= 6.000	
19 MATERIAL COST ESCAL. - PERCT/YR (9,13)	= 5.000	24 AIRLINE PRE-PAYMENT - YES=0, NO=1	= 1.000	
40 TECHNICAL FACTOR - ENGINEERING (1)	= 0.605	41 TECHNICAL FACTOR - TOOLING (1)	= 0.745	
42 TECHNICAL FACTOR - FLIGHT TEST (1)	= 0.636	43 TECHNICAL FACTOR - DEV. SUPPORT (1)	= 0.536	
46 TECHNICAL FACTOR - PERM. MFG LABOR (1)	= 0.836	47 TECHNICAL FACTOR - MATERIALS (1)	= 0.814	
8 PROFIT - PERCENT OF TOTAL COST	= 10.000	14 PRICING UNIT (INCLUDES PROFIT) (8)	= 400.000	
31 ENGINE COST - \$M (12,14)	= 0.341	23 CONSTANT DOLLAR YEAR (NO = 0) (18)	= 1974.500	

THIS IS A SINGLE NEW AIRCRAFT PROGRAM

AIRFRAME DEVELOPMENT COSTS *

(MILLIONS OF DOLLARS)

INITIAL ENGINEERING	INITIAL TOOLING	DEVELOPMENT SUPPORT	TEST FLIGHT	PROGRAM LAB	EXTRODINARY DEVELOPMENT	TOTAL
30.34	31.95	13.83	26.52	6.07	0.0	108.70

* EXCLUDING THRUPUTS, INVESTMENT AND WORKING CAPITAL COSTS, AND PROFITS
COST ESCALATION PRORATED PROPORTIONATELY AMONG THE COST ELEMENTS

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JR JET - SEPTEMBER 12
RUN 4

AIRCRAFT COSTS AND PROFITS
***** * *** *** *****
(MILLIONS OF DOLLARS)

PRODUCTION QUANTITY	RATE	PROD	CUM COSTS DEVEL INTEREST	TOTAL	UNIT COSTS	CUM AV COSTS	REVENUE TOTAL	UNIT	PROFIT CUM AV	TOTAL
1	1.0	7.	109.	14.	129.	0.0	128.79	3.	0.0	-125.60
3	1.0	25.	109.	15.	148.	9.70	49.39	10.	-6.51	-46.21
5	1.0	38.	109.	16.	162.	7.13	32.49	16.	-3.95	-29.31
10	1.0	65.	109.	18.	191.	5.70	19.09	32.	-2.51	-15.91
20	3.0	106.	109.	27.	242.	5.06	12.08	64.	-1.88	-8.89
30	4.8	142.	109.	27.	277.	3.55	9.24	95.	-0.37	-6.05
40	5.7	174.	109.	32.	315.	3.76	7.87	127.	-0.57	-4.68
50	6.0	204.	109.	37.	350.	3.58	7.01	159.	-0.39	-3.83
60	8.0	233.	109.	37.	379.	2.87	6.32	191.	0.32	-3.13
70	8.0	260.	109.	43.	412.	3.30	5.89	223.	-0.12	-2.70
80	8.0	287.	109.	43.	439.	2.66	5.48	255.	0.53	-2.30
90	8.0	313.	109.	43.	464.	2.58	5.16	286.	0.60	-1.98
100	8.0	338.	109.	48.	495.	3.03	4.95	318.	0.15	-1.76
120	8.0	387.	109.	53.	548.	2.68	4.57	382.	0.51	-1.39
140	8.0	434.	109.	53.	595.	2.35	4.25	446.	0.84	-1.07
160	8.0	479.	109.	57.	645.	2.50	4.03	509.	0.68	-0.85
180	8.0	523.	109.	61.	694.	2.42	3.85	573.	0.76	-0.67
200	8.0	567.	109.	65.	741.	2.35	3.70	637.	0.83	-0.52
220	8.0	609.	109.	68.	786.	2.28	3.57	700.	0.90	-0.39
250	8.0	672.	109.	71.	851.	2.17	3.41	796.	1.01	-0.22
300	8.0	774.	109.	74.	957.	2.11	3.19	955.	1.08	-0.01
350	4.0	873.	109.	75.	1057.	2.01	3.02	1114.	1.17	0.16
400	4.0	971.	109.	78.	1158.	2.02	2.90	1273.	1.16	0.29
450	4.0	1068.	109.	81.	1258.	1.99	2.79	1432.	1.19	0.39
500	4.0	1164.	109.	84.	1356.	1.97	2.71	1591.	1.22	0.47
550	4.0	1258.	109.	87.	1454.	1.95	2.64	1751.	1.23	0.54
600	4.0	1353.	109.	89.	1551.	1.95	2.59	1910.	1.23	0.60
650	4.0	1448.	109.	93.	1649.	1.96	2.54	2069.	1.22	0.65
700	4.0	1542.	109.	96.	1747.	1.94	2.50	2228.	1.24	0.69
750	4.0	1637.	109.	98.	1844.	1.94	2.46	2387.	1.24	0.72
800	4.0	1731.	109.	101.	1941.	1.94	2.43	2546.	1.24	0.76
850	4.0	1825.	109.	104.	2038.	1.94	2.40	2705.	1.24	0.79
900	4.0	1919.	109.	107.	2134.	1.94	2.37	2865.	1.25	0.81
950	4.0	2013.	109.	110.	2232.	1.95	2.35	3024.	1.23	0.83

AIRCRAFT DELIVERY - PRICE SCHEDULE

1977 - 94. A/C AT \$ 3.18M CUM - 94. A/C AT \$ 3.18M	1978 - 96. A/C AT \$ 3.18M CUM - 190. A/C AT \$ 3.18M	1979 - 96. A/C AT \$ 3.18M CUM - 286. A/C AT \$ 3.18M	1980 - 76. A/C AT \$ 3.18M CUM - 362. A/C AT \$ 3.18M
1981 - 48. A/C AT \$ 3.18M CUM - 410. A/C AT \$ 3.18M	1982 - 48. A/C AT \$ 3.18M CUM - 458. A/C AT \$ 3.18M	1983 - 48. A/C AT \$ 3.18M CUM - 506. A/C AT \$ 3.18M	1984 - 48. A/C AT \$ 3.18M CUM - 554. A/C AT \$ 3.18M

C-3 FOLDOUT FRAME 2

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C.2 RETURN ON INVESTMENT ANALYSIS

Table C-2 presents the results of an illustrative analysis of ROI with a machine program. The assumptions and input data are listed on the first page. Revenue and cost input data in dollars per mile are shown on the second page. A computed rate of return on investment is reproduced as a series of data points by year is shown in Figure C-1. It was assumed that the aircraft entered service in 1975.

These data sheets are typical of those generated in the ROI of the 30 and 70 passenger medium density basepoint aircraft reported in Section 15.1.

TABLE C-2
 BASEPOINT DESIGN AIRCRAFT RETURN ON INVESTMENT
 JR JET ***** ROI ***** 50 SEATS, AUGUST 6

AIRCRAFT ASSUMPTIONS

DELIVERY DATE 6/1974
 ECONOMIC LIFE 15 YEARS

	1 AIRCRAFT	SPARES	GROUND SUPPORT EQUIPMENT
TOTAL PRICE	2990000.	0.	0.
DEPRECIABLE LIFE	15 YEARS	0 YEARS	0 YEARS
RESIDUAL PERCENTAGE	15.0	0.0	0.0
START UP COSTS	37500.		
POSSIBLE I.T.C.	209300.		

DEPRECIATION METHOD (FOR AIRCRAFT) -- STRAIGHT LINE

INCOME TAX RATE 48.0 PERCENT
 DISCOUNT RATE FOR NEGATIVE CASH FLOWS 10.0 PERCENT

BLOCK SPEED	319.	319.	319.	319.	319.	319.	319.	319.	319.	319.
PASSENGER SEATS PER AIRCRAFT	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
ANNUAL PASSENGER UTILIZATION (HOURS)	2845.	2845.	2845.	2845.	2845.	2845.	2845.	2845.	2845.	2845.
PASSENGER LOAD FACTOR (PERCENT)	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

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REVENUE AND COST ASSUMPTIONS

12 MONTHS ENDING *****	PER RPM		PER MILE		PER MILE	
	*****		*****		*****	
	YIELD	GROWTH	DOC	GROWTH	IOC	GROWTH
*****	*****	*****	*****	*****	*****	
5/31/75	0.1420		1.2300		2.0500	
5/31/76	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/77	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/78	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/79	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/80	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/81	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/82	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/83	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/84	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/85	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/86	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/87	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/88	0.1420	0.0	1.2300	0.0	2.0500	0.0
5/31/89	0.1420	0.0	1.2300	0.0	2.0500	0.0

DEBT REPAYMENT ASSUMPTIONS

NO COMPUTATIONS REQUESTED FOR THIS CASE

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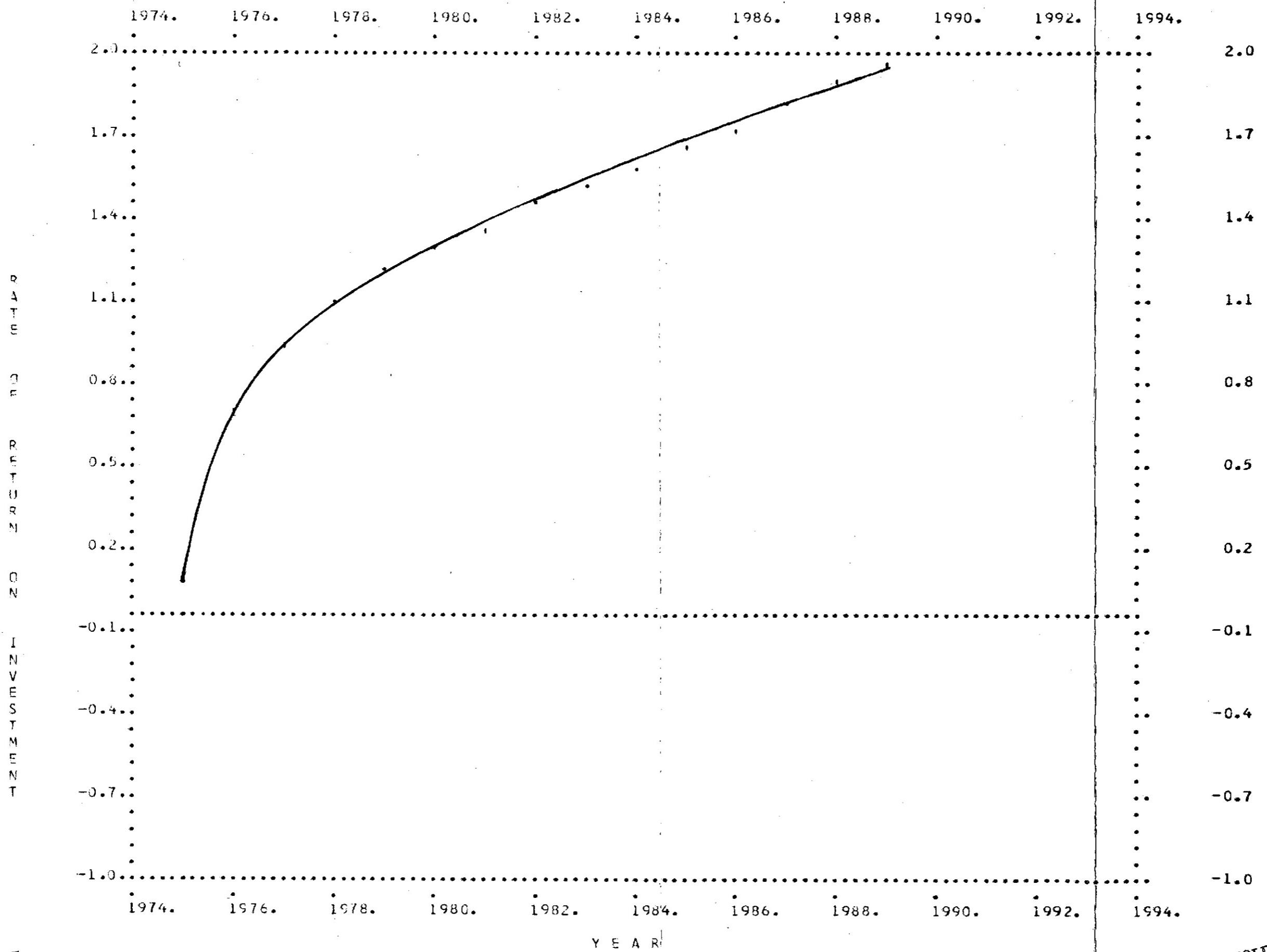


Figure C-1 - RATE OF RETURN BY YEAR - 50 PASSENGER BASEPOINT AIRCRAFT